Forfás

State Expenditure on Science & Technology, 2000

Volume One – The Total Science and Technology Budget

THE NATIONAL POLICY AND ADVISORY BOARD FOR ENTERPRISE, TRADE, SCIENCE, TECHNOLOGY AND INNOVATION

Functions of Forfás

Is é Forfás an bord náisiúnta um polasaí agus comhairle le haghaidh fiontraíochta, trádála, eolaíochta, teicneolaíochta agus nuála. Is é an comhlacht é a bhfuil comhactaí dlíthiúla an stáit maidir le cur-chun-cinn tionscail agus forbairt teicneolaíochta dílsithe ann. Is é an comhlacht é freisin trína dciomnaítear cumhachtaí ar Fhiontraíocht Éireann le tionscail dúchais a chur chus cinn agus ar ghníomhaireacht Forbartha Tionscail na hÉireann (GFT Éireann) le hinfheistíocht isteach sa tir a chur chun tosaight. Is iad feighmeanna Fhorfáis:

- *comhairle a chur ar an Aire ó thaobh cúrsaí a bhaineann le forbairt tionscail sa Stát*
- *comhairle maidir le forbairt agus comhordú polasaithe a chur ar fáil d'Fhiontraíocht Éireann, d'GFT Éireann agus d'aon fhoras eile dá leithéid (a bunaíodh go reachtúil) a d'fhéadfadh an tAire a ainmniú trí ordú*
- *forbairt na tionsclaíochta, na teicneolaíochta, na margaíochta agus acmhainní daonna a spreagadh sa Stát*
- *bunú agus forbairt gnóthas tionsclaíoch ón iasacht a spreagadh sa Stát, agus*
- *Fiontraíocht Éireann agus GFT Éireann a chomhairliú agus a chomhordú ó thaobh a gcuid feidhmeanna.*

Forfás is the national policy and advisory board for enterprise, trade, science, technology and innovation. It is the body in which the State's legal powers for industrial promotion and technology development have been vested. It is also the body through which powers are delegated to Enterprise Ireland for the promotion of indigenous industry and to IDA Ireland for the promotion of inward investment. The broad functions of Forfás are to:

- *advise the Minister on matters relating to the development of industry in the State*
- *to advise on the development and co-ordination of policy for Enterprise Ireland, IDA Ireland and such other bodies (established by or under statute) as the Minister may by order designate*
- *encourage the development of industry, technology, marketing and human resources in the State*
- *encourage the establishment and development in the State of industrial undertakings from outside the State, and*
- *advise and co-ordinate Enterprise Ireland and IDA Ireland in relation to their functions.*

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State Expenditure on Science & Technology, 2000

Volume One – The Total Science and Technology Budget

Science and Technology Budget

Review of State Expenditure on Science and Technology 1990-2000

Incorporating financial expenditures in 1999 and allocations for 2000 by Government to Institutions engaged in any activity related to science and technology.

Evaluation and Indicators Unit

August 2001

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1 Executive Summary

Volume 1: Total Science and Technology Budget

The 'Science and Technology Budget' – the annual Forfás publication on State expenditure on science and technology – provides details of the allocations made by Government to scientific and technological (S&T) activities. In all, 42 government departments/agencies are included in the 2000 S&T Budget.

The total value of the Science and Technology Budget in 2000 amounts to £1,100m (€1,396.7m), an increase of £187.4m (€237.9m) or 20.5% over the 1999 level. All of the increase is accounted for by public funds, which rose from £749m (€951m) outturn in 1999 to an allocation of £934m (€1185.9m) in 2000; the balance of £166m (€210.8m) arises from income earned from the activities of the departments and agencies.

While the total figure is large, the coverage of the Science and Technology Budget is very wide and includes S&T-based activities such as those of Met Éireann, Geological Survey and some elements of the Office of Public Works.

Volume 2: Research and Development in the Public Sector

For the first time this year's 'State Expenditure on Science and Technology' includes a separate volume on research and development. Altogether Research and Development represents about a quarter of public science and technology expenditure.

The level of R&D performed in the various Government Departments and their agencies is not the same as the total amounts they fund. An individual Department or its agencies might perform little or no R&D themselves while providing funding to other performers in either the public or private sectors.

In terms of public *funding*, the Departments and their agencies are allocating £232.9m (€295.7m) to R&D in 2000. This represents a very significant increase over the actual expenditure in 1999 of £147.7m (€187.5m). The major increases relate to additional allocations by the Department of Education and Science via the Higher Education Authority (£31m (€39.4m)) for research in the third level institutions, to the new Technology Foresight Fund (£25m, €31.7m) introduced by the Department of Enterprise, Trade and Employment (DETE) to establish Ireland as a leading research player in biotechnology and information and communications technologies, and to extra funding by DETE via Enterprise Ireland (£14m (€17.8m)) for R&D grants to industry.

The allocation for *performance* of R&D in 2000 is £53.8m (€68.3m), up from £50.2m (€63.7m) in 1999. This figure includes £11.4m (€14.5m) which is earned income so that the public funds invested in R&D performed in the public sector amount to £42.4m (€53.8m) in 2000.

2 Introduction

The last few years have seen an unprecedented reappraisal of Irish science, technology and education policies. The Irish Government accepts that there is a direct link between the expenditure on research and economic return. The Government has responded with ambitious plans in the third-level system and the industrial sector over the period 2000 – 2006. These are outlined below:

2.1 Research proposals in the National Development Plan (2000 -2006)

The National Development Plan was published in November 1999. It sets out a course of initiatives and programmes aimed at ensuring continued economic prosperity for Ireland. A cornerstone of the plan is to establish Ireland as a knowledge-based economy. The Government has allocated £1.9 billion (€2.41 billion) to Research, Technological Development and Innovation (RTDI) over the course of the plan.

2.2 Technology Foresight Initiative

A key element of the National Development Plan in terms of support for R&D is the Technology Foresight Fund. This Fund was born of a Technology Foresight exercise that identified a gap in Ireland's research base. The Technology Foresight Report, prepared by the Irish Council for Science, Technology and Innovation (ICSTI), recommended that a fund be established totalling £500 million (€634.9m) over five years to support research projects in key technologies strategic to long-term sectoral and national development. The Department of Enterprise, Trade and Employment subsequently allocated over £500m (€634.9m) to this Fund over the lifetime of the National Development Plan and established *Science Foundation Ireland* to implement the Fund.

2.3 Infrastructure - The Programme for Research in the Third-level Institutes

The Department of Education and Science launched its Programme for Research in Third Level Institutions in late 1998 and about £550m (€698.4m) is included in the National Development Plan for further investments to strengthen the research capabilities of the third level colleges.

2.4 Science and Technology Budget 2000

Changes have been made to the 'Science & Technology Budget' – the annual Forfás publication on State Expenditure on Science and Technology – to reflect the new situation. The changes are not radical ones but they have been made in response to some of the work of ICSTI on public expenditure priorities. For the most part the changes are to the way in which the data are presented, giving greater prominence and emphasis than in the past to research and development. Arising from the greater visibility of, and interest in, the S&T Budget a number of Government Departments have requested changes in the coverage of the data relating to their activities. As far as possible, without too great an impact on the long-established time series of S&T Budget data, those requests have been complied with.

This document provides details of the allocations made by Government to scientific and technological (S&T) activities. In all, 43 government departments/agencies are included in the 2000 S&T Budget. The information on which the analysis is based was supplied by government departments, offices, agencies and other recipient institutions following finalisation of the overall government estimates for the public services for 2000, and after the operating institutions had decided on the distribution of their allocations over their programmes.

Figure 1 indicates the public sector organisations funding and performing S&T activities in 2000.

Figure 1 *Government Departments/Agencies Funding S&T, 2000*

DEPARTMENTS	AGENCY	DEPARTMENTS	AGENCY
Agriculture & Food	Teagasc	Education & Science	HEA DIAS
Enterprise, Trade & Employment	Forfás Enterprise Ireland IDA Ireland NMRC Patents Office NMAC FÁS Innovation Centre NSAI	Environment & Local Government Social, Community and Family Affairs Arts, Heritage, Gaeltacht and the Islands	EPA NRA Údarás na Gaeltachta Natural History Museum
Public Enterprise	GSI RPII Met Éireann	Health & Children	HRB Postgraduate Medical & Dental Board
Marine & Natural Resources	Marine Institute BIM Central Fisheries Board COFORD	Taoiseach	NESC
OFFICES	CSO OPW Central Bank	State Laboratory	Ordnance Survey
INCORPORATED COMPANIES	ESRI Shannon Development		

See appendix 2 for explanation of acronyms.

Section 2 brings together the total S&T picture for the public sector, including non-exchequer monies – mainly fees and other earned income – of institutions which operate science and technology programmes.

Section 3 considers other public sector activities related to the productive sectors of the economy. Section 4 covers S&T education, training and health, while Section 5 includes a range of other public sector S&T activities. Section 6 is concerned with science and technology activities undertaken by the Government in support of economic and social activities.

3 Total Government Funding of Science and Technology

3.1 Total Funding and Trends

The total public expenditure on science and technology occurs under five broad headings:

- Research and Development activities (as detailed in Volume Two of this report)
- Other S&T activities in support of industry, agriculture and food, the environment, marine and forestry, energy and transportation
- Education and health
- Other public service activities
- Economic and social activities

The total of these five components constitutes the State Investment in Science and Technology for 2000 (the 'Science and Technology Budget'). Funding for these activities come from three sources – the exchequer, the Community Support Framework (CSF) of the EU, and income earned by the agencies/departments implementing science and technology programmes.

The total value of the science and technology budget in 2000 amounts to £1,100m (€1,396.7m) and Table 1 identifies the sources of funding for 1990, 1995, 1999 and 2000.

Table 1: *Government funding of Science and Technology by source of funds, current prices*

	1990 Outturn		1995 Outturn		1999 Outturn		2000 Allocation	
	£m	%	£m	%	£m	%	£m	%
Exchequer funds	226.13	65%	377.85	63%	637.44	70%	827.34	75%
CSF Contribution	28.05	8%	72.76	12%	111.53	12%	106.73	10%
Total public funds	**254.18**	**73%**	**450.61**	**75%**	**748.97**	**82%**	**934.07**	**85%**
Earned income	94.10	27%	151.25	25%	164.16	18%	166.43	15%
Total	**348.28**	**100%**	**601.86**	**100%**	**913.13**	**100%**	**1,100.50**	**100%**

Table 1A: *Government funding of Science and Technology by source of funds, current prices*

	1990 Outturn		1995 Outturn		1999 Outturn		2000 Allocation	
	€m	%	€m	%	€m	%	€m	%
Exchequer funds	287.13	65%	479.77	63%	809.38	70%	1,050.51	75%
CSF Contribution	35.62	8%	92.39	12%	141.61	12%	135.52	10%
Total public funds	**322.75**	**73%**	**572.16**	**75%**	**950.99**	**82%**	**1,186.03**	**85%**
Earned income	119.48	27%	192.05	25%	208.44	18%	211.32	15%
Total	**442.23**	**100%**	**764.21**	**100%**	**1,159.43**	**100%**	**1,397.35**	**100%**

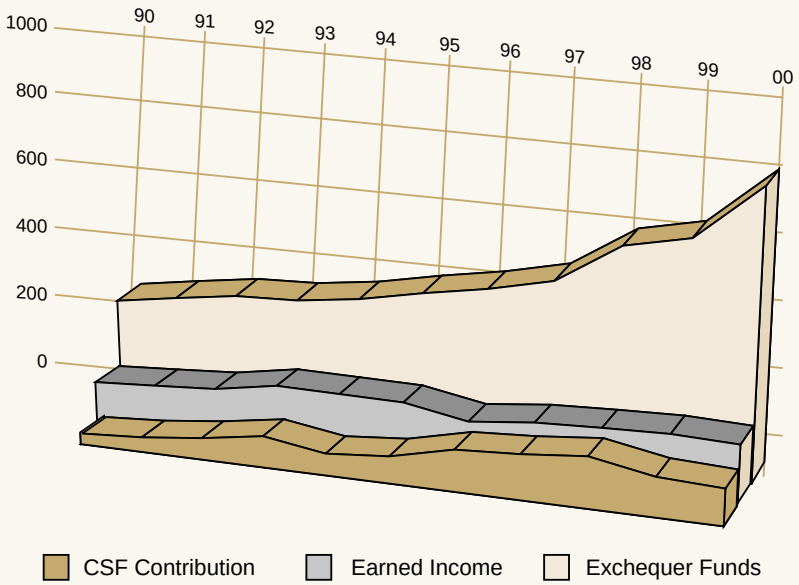
There was an increase of £187.4m (€237.9m), or 20.5% in the Total 'Science and Technology Budget' over the 1999 level. Increased Exchequer funding amounted to £189.9m (€241.1m), with earned income remaining relatively constant and the EU contribution expected to decline. The major increases occurred in the following four areas:

1. Institutes of Technology/Dublin Institute of Technology grants administered by the Department of Education (£65m, €82.5m)
2. Programme for Research in Third Level Institutions administered by the Higher Education Authority (£30m, €38.1m)
3. The implementation of the Technology Foresight Fund via *Science Foundation Ireland* (£25m, €31.7m)
4. Support for industry administered by Enterprise Ireland for the Office of Science and Technology (£17m, €21.6m)
5. National Beef Assurance Scheme administered by the Department of Agriculture, Food and Rural Development (£8m, €10.2m)

In 2000 the EU contribution to Irish S&T will decrease to £106.7m (€135.5m) from £111.5m (€141.6m) in 1999, or 10% of the total in 2000 down from 12% in 1999. This contribution comes via the Community Support Framework and consists of three separate funds – the European Regional Development Fund (ERDF), the European Social Fund (ESF) and the European Agriculture, Guidance and Guarantee Fund (EAGGF).

Figure 2 illustrates the trends in funding in the recent past.

Figure 2: *Distribution of Government supported S&T by source of funds, 2000 prices, £m*



Exchequer funds grew by 9.9% on average per annum between 1990 and 1999 in real terms. A further real increase of 24.2% is expected in 2000. CSF funds peaked in 1998 with £151m (¤191.7m) in real terms with earned income averaging £155.4m (¤197.3m) per annum between 1990 and 2000.

3.2 Funding by Type of Cost

Table 2: *Government funding of Science and Technology by type of costs, current prices*

	1990		1995		1999		2000 Allocation	
	£m	%	£m	%	£m	%	£m	%
Public current monies*	234.33	67%	424.54	71%	625.96	69%	753.49	68%
Public capital monies	19.85	6%	26.06	4%	123.01	13%	180.58	16%
Total public funds	**254.18**	**73%**	**450.60**	**75%**	**748.97**	**82%**	**934.07**	**85%**
Earned income	94.10	27%	151.25	25%	164.16	18%	166.43	15%
Total	**348.28**	**100%**	**601.85**	**100%**	**913.13**	**100%**	**1,100.50**	**100%**

* Public monies are exchequer plus CSF funds

Table 2A: *Government funding of Science and Technology by type of costs, current prices*

	1990		1995		1999		2000 Allocation	
	€m	%	€m	%	€m	%	€m	%
Public current monies*	297.54	67%	539.05	71%	794.81	69%	956.73	68%
Public capital monies	25.20	6%	33.09	4%	156.19	13%	229.29	16%
Total public funds	**322.74**	**73%**	**572.14**	**75%**	**951.00**	**82%**	**1,186.02**	**84%**
Earned income	119.48	27%	192.05	25%	208.44	18%	211.32	16%
Total	**442.22**	**100%**	**764.19**	**100%**	**1,159.44**	**100%**	**1,397.34**	**100%**

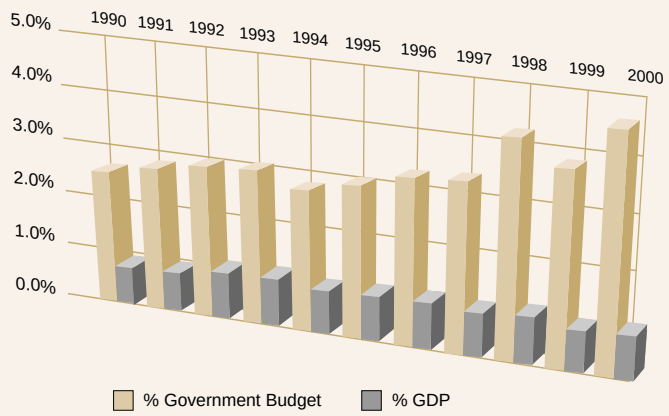
* Public monies are exchequer plus CSF funds

Table 2 shows a significant increase in public capital monies since 1999 from £123m (¤156.2m) to £181m (¤229.8m), and more dramatically since 1995 from £26m (¤33m). These increases are due to the increased investment by the Department of Education & Science in upgrading the capital infrastructure of the third level institutes.

3.3 Comparison with GDP and Total Government Budgets

Public funding for S&T as a percentage of total government budgets shows a steady increase since 1990 (2.5%) to reach 4.4% in 2000 (Figure 3). This positive trend reflects the government's increasing commitment to science and technology. Public funds for S&T as a percentage of GDP has remained at 1.1% on average over the last ten years.

Figure 3 *Public funding of S&T* : % Government budget, % GDP 1990-2000*



**Exchequer plus CSF*

3.4 Government Departments/Agencies funding Science and Technology

Table 3 presents each Department/Agencies allocation to S&T analysed by source of funds. Some agency programmes are extremely reliant on non-exchequer sources for their income in the form of CSF funds and earned income while others are funded entirely from exchequer sources. The agencies which receive most CSF support are the Department of Education and Science, the Higher Education Authority, Enterprise Ireland, FÁS, IDA Ireland, Shannon Development, Teagasc, the Department of Agriculture and Food and the NMRC. The NSAI and the Patents Office are more reliant on earned income to fund their S&T expenditure.

Table 3: *2000 Science and Technology Allocation to Departments/Agencies by source of funds*

	Exchequer £'000	CSF funds £'000	Total public £'000	Earned income £'000	Total £'000
Department of Education and Science	293,555	18,745	312,300		312,300
- Higher Education Authority	266,282	10,815	277,097	82,110	359,207
- Dublin Institute for Advanced Studies	1,815	38	1,853	335	2,188
Department of Enterprise, Trade & Employment	5,933	484	6,417		6,417
- Enterprise Ireland	19,671	45,068	64,739	12,023	76,762
- FÁS	16,620	12,810	29,430		29,430
- National Microelectronics Research Centre	4,571	1,978	6,549	5,304	11,853
- N.S.A.I	2,535		2,535	8,326	10,861
- Shannon Development	3,310	4,000	7,310		7,310
- IDA Ireland	50	4,000	4,050		4,050
- Patents Office	-2,434		-2,434	5,332	2,898
- Forfás (inc. NAB)	26,362		26,362	235	26,597
- Innovation Centre	495	270	765		765
- National Microelectronics Applications Centre				610	610
Department of Agriculture and Food	29,620	1,967	31,587	6,220	37,807
- Teagasc	37,826	2,815	40,641	17,741	58,382
Department of Health and Children	6,529		6,529	4,966	11,495
- Health Research Board	9,595		9,595	1,765	11,360
- Postgraduate Medical & Dental Board	2,857		2,857		2,857
Central Statistics Office	22,056		22,056	1,370	23,426
Department of Marine and Natural Resources	1,346		1,346	237	1,583
- Marine Institute	13,038	639	13,677	2,057	15,734
- Bord Iascaigh Mhara	1,334	1,095	2,429	55	2,484
- Central & Regional Fisheries Board	1,200		1,200		1,200
- COFORD	565	554	1,119		1,119
Department of Public Enterprise					
- Geological Survey of Ireland	6,888		6,888	210	7,098
- Met Éireann	6,707		6,707	5,660	12,367
- Radiological Protection Institute of Ireland	1,490		1,490	715	2,205
Department of Environment and Local Government	1,488		1,488		1,488

Table 3: *2000 Science and Technology Allocation to Departments/Agencies by source of funds*

	Exchequer £'000	CSF funds £'000	Total public £'000	Earned income £'000	Total £'000
- Environmental Protection Agency	7,738	650	8,388	4,000	12,388
- N.R.A	1,752		1,752	187	1,939
Department of Social, Community and Family Affairs	12,148		12,148	45	12,193
Ordnance Survey Office	6,325		6,325	5,000	11,325
Office of Public Works	6,750		6,750		6,750
Department of Finance					
- Economic and Social Research Institute	3,373		3,373	1,914	5,287
Department of Arts, Heritage, Gaeltacht and the Islands	1,690		1,690		1,690
- Natural History Museum	170		170		170
- Údarás na Gaeltachta	1,250	800	2,050		2,050
State Laboratory	3,889		3,889		3,889
Central Bank	481		481		481
Department of the Taoiseach					
- National Economic and Social Council	470		470	10	480
Total	**827,339**	**106,728**	**934,067**	**166,427**	**1,100,494**

* Where there are transfers from one S&T agency/department to another the funds are accounted for in the performing agency.

Note: Earned income assigned to the Higher Education Authority refers to funds which the colleges under its aegis receive by way of fees for education courses and income generated from contract research activity. These funds are not allocated by the HEA to colleges.

Table 3A: *2000 Science and Technology Allocation to Departments/Agencies by source of funds*

	Exchequer €'000	CSF funds €'000	Total public €'000	Earned income €'000	Total €'000
Department of Education and Science	372,738	23,801	396,539		396,539
- Higher Education Authority	338,108	13,732	351,840	104,258	456,098
- Dublin Institute for Advanced Studies	2,305	48	2,353	425	2,778
Department of Enterprise, Trade & Employment	7,533	614	8,147		8,147
- Enterprise Ireland	24,977	57,225	82,202	15,266	97,468
- FÁS	21,103	16,265	37,368		37,368
- National Microelectronics Research Centre	5,804	2,512	8,316	6,735	15,051
- N.S.A.I	3,219		3,219	10,572	13,791
- Shannon Development	4,203	5,079	9,282		9,282
- I.D.A Ireland	63	5,079	5,142		5,142
- Patents Office	-3,091		-3,091	6,770	3,679
- Forfás (inc. NAB)	33,473		33,473	298	33,771
- Innovation Centre	629	343	972		972

Table 3A: *2000 Science and Technology Allocation to Departments/Agencies by source of funds*

	Exchequer €'000	CSF funds €'000	Total public €'000	Earned income €'000	Total €'000
- National Microelectronics Applications Centre				775	775
Department of Agriculture and Food	37,610	2,498	40,108	7,898	48,006
- Teagasc	48,029	3,574	51,603	22,526	74,129
Department of Health and Children	8,290		8,290	6,306	14,596
- Health Research Board	12,183		12,183	2,241	14,424
- Postgraduate Medical & Dental Board	3,628		3,628		3,628
Central Statistics Office	28,005		28,005	1,740	29,745
Department of Marine and Natural Resources	1,709		1,709	301	2,010
- Marine Institute	16,555	811	17,366	2,612	19,978
- Bord Iascaigh Mhara	1,694	1,390	3,084	70	3,154
- Central & Regional Fisheries Board	1,524		1,524		1,524
- COFORD	717	703	1,420		1,420
Department of Public Enterprise					
- Geological Survey of Ireland	8,746		8,746	267	9,013
- Met Éireann	8,516		8,516	7,187	15,703
- Radiological Protection Institute of Ireland	1,892		1,892	908	2,800
Department of Environment and Local Government	1,889		1,889		1,889
- Environmental Protection Agency	9,825	825	10,650	5,079	15,729
- N.R.A	2,225		2,225	237	2,462
Department of Social, Community and Family Affairs	15,425		15,425	57	15,482
Ordnance Survey Office	8,031		8,031	6,349	14,380
Office of Public Works	8,571		8,571		8,571
Department of Finance					
- Economic and Social Research Institute	4,283		4,283	2,430	6,713
Department of Arts, Heritage, Gaeltacht and the Islands	2,146		2,146		2,146
- Natural History Museum	216		216		216
- Údaras na Gaeltachta	1,587	1,016	2,603		2,603
State Laboratory	4,938		4,938		4,938
Central Bank	611		611		611
Department of the Taoiseach					
- National Economic and Social Council	597		597	13	610
Total	**1,050,504**	**135,517**	**1,186,020**	**211,319**	**1,397,339**

* *Where there are transfers from one S&T agency/department to another the funds are accounted for in the performing agency.*

Note: Earned income assigned to the Higher Education Authority refers to funds which the colleges under its aegis receive by way of fees for education courses and income generated from contract research activity. These funds are not allocated by the HEA to colleges.

Tables 4 analyses the breakdown of the increase in 2000 over 1999. The total increase in public funds over the 1999 outturn amounts to £185.1m (€235m). An increase of over £80m (€101.6m) is noted for the Department of Education and Science over 1999 figures, the majority of this funding has been allocated via the Higher Education Authority for research in third level institutions. Another significant increase over 1999 funding is seen in the Department of Enterprise, Trade and Employment where an extra £53.7m (€68.2m) has been allocated to fund science and technology based activities in 2000. Table 5 gives a breakdown between current and capital costs.

Table 4: *2000 Total Increase on 1999 Public Funding by Department, £'000*

	Increase in Funding over 1999 £'000
Department of Education and Science	81,990
Department of Enterprise, Trade and Employment	53,763
Department of Agriculture and Food	10,290
Department of Social, Community and Family Affairs	7,180
Department of the Marine and Natural Resources	6,039
Department of Public Enterprise	5,955
Department of Health and Children	5,829
Office of Public Works	4,628
Central Statistics Office	4,623
Ordnance Survey Office	2,496
Department of the Environment and Local Government	1,525
Department of Finance	400
State Laboratory	399
Central Bank	94
Department of the Taoiseach	6
Department of Arts, Heritage, Gaeltacht and the Islands	- 29
Total	**185,188**

Table 4A: *2000 Total Increase on 1999 Public Funding by Department, €'000*

	Increase in Funding over 1999 €'000
Department of Education and Science	104,106
Department of Enterprise, Trade and Employment	68,265
Department of Agriculture and Food	13,066
Department of Social, Community and Family Affairs	9,117
Department of the Marine and Natural Resources	7,668
Department of Public Enterprise	7,561
Department of Health and Children	7,401
Office of Public Works	5,876
Central Statistics Office	5,870
Ordnance Survey Office	3,169
Department of the Environment and Local Government	1,936
Department of Finance	508
State Laboratory	506
Central Bank	119
Department of the Taoiseach	8
Department of Arts, Heritage, Gaeltacht and the Islands	- 37
Total	**235,140**

Table 5: *2000 Science and Technology Allocation to Agencies/Departments (*) by type of costs*

	Public Funds **		Total Public Allocation 2000	Total Public Funds 1999 Outturn
	Capital £'000	Current £'000	£'000	£'000
Department of Agriculture and Food	394	31,193	31,587	22,014
- Teagasc	371	40,270	40,641	39,924
Department of Arts, Heritage, Gaeltacht and the Islands		1,690	1,690	1,651
- Natural History Museum	22	148	170	170
- Údaras na Gaeltachta		2,050	2,050	2,118
Central Statistics Office	826	21,230	22,056	17,433
Central Bank		481	481	387
Department of Education and Science	86,427	225,873	312,300	291,968
- Dublin Institute for Advanced Studies		1,853	1,853	1,769
- Higher Education Authority	73,083	204,014	277,097	215,523
Department of Enterprise, Trade & Employment	578	5,839	6,417	6,530
- FÁS		29,430	29,430	22,314
- Enterprise Ireland	895	63,844	64,739	47,161
- Forfás (incl. NAB)		26,362	26,362	1,203
- IDA Ireland		4,050	4,050	3,920
- Innovation Centre		765	765	795
- National Microelectronics Applications Centre				100
- National Microelectronics Research Centre	3,300	3,249	6,549	3,706
- NSAI	65	2,470	2,535	2,406
- Patents Office		-2,434	-2,434	- 3,219
- Shannon Development		7,310	7,310	7,044
Department of Environment and Local Government	450	1,038	1,488	1,350
- Environmental Protection Agency		8,388	8,388	7,125
- National Roads Authority		1,752	1,752	1,628
Department of Finance				
- Economic and Social Research Institute		3,373	3,373	2,972
Department of Health and Children	763	5,766	6,529	4,786
- Health Research Board	2,700	6,895	9,595	5,842
- Postgraduate Medical and Dental Board		2,857	2,857	2,524
Department of Marine and Natural Resources		1,346	1,346	773
- Bord Iascaigh Mhara	907	1,522	2,429	2,208
- Central and Regional Fisheries Board		1,200	1,200	1,420
- COFORD		1,119	1,119	1,050
- Marine Institute		13,677	13,677	8,281
Office of Public Works	6,750		6,750	2,122
Ordnance Survey Office	951	5,374	6,325	3,829
Department of Public Enterprise				
- Geological Survey of Ireland	1,296	5,592	6,888	2,655
- Met Éireann	645	6,062	6,707	5,137
- Radiological Protection Institute of Ireland	153	1,337	1,490	1,338
Department of Social, Community and Family Affairs		12,148	12,148	4,968
State Laboratory		3,889	3,889	3,490
Department of the Taoiseach				
- National Economic and Social Council		470	470	464
Total	**180,576**	**753,492**	**934,068**	**748,879**

* Where there are transfers from one S&T agency/department to another the funds are accounted for in the performing agency

**Public funds are exchequer & CSF funds

Table 5A: *2000 Science and Technology Allocation to Agencies/Departments (*) by type of costs*

	Public Funds **		Total Public Allocation 2000	Total Public Funds 1999 Outturn
	Capital €'000	Current €'000	€'000	€'000
Department of Agriculture and Food	500	39,607	40,107	27,952
- Teagasc	471	51,132	51,603	50,693
Department of Arts, Heritage, Gaeltacht and the Islands		2,146	2,146	2,096
- Natural History Museum	28	188	216	216
- Údarás na Gaeltachta		2,603	2,603	2,689
Central Statistics Office	1,049	26,957	28,006	22,135
Central Bank		611	611	491
Department of Education and Science	109,740	286,800	396,540	370,723
- Dublin Institute for Advanced Studies		2,353	2,353	2,246
- Higher Education Authority	92,796	259,044	351,840	273,658
Department of Enterprise, Trade & Employment	734	7,414	8,148	8,291
- FÁS		37,368	37,368	28,333
- Enterprise Ireland	1,136	81,065	82,201	59,882
- Forfás (incl. NAB)		33,473	33,473	1,527
- IDA Ireland		5,142	5,142	4,977
- Innovation Centre		971	971	1,009
- National Microelectronics Applications Centre				127
- National Microelectronics Research Centre	4,190	4,125	8,315	4,706
- NSAI	83	3,136	3,219	3,055
- Patents Office		-3,091	-3,091	- 4,087
- Shannon Development		9,282	9,282	8,944
Department of Environment and Local Government	571	1,318	1,889	1,714
- Environmental Protection Agency		10,651	10,651	9,047
- National Roads Authority		2,225	2,225	2,067
Department of Finance				
- Economic and Social Research Institute		4,283	4,283	3,774
Department of Health and Children	969	7,321	8,290	6,077
- Health Research Board	3,428	8,755	12,183	7,418
- Postgraduate Medical and Dental Board		3,628	3,628	3,205
Department of Marine and Natural Resources		1,709	1,709	982
- Bord Iascaigh Mhara	1,152	1,932	3,084	2,804
- Central and Regional Fisheries Board		1,524	1,524	1,803
- COFORD		1,421	1,421	1,333
- Marine Institute		17,366	17,366	10,515
Office of Public Works	8,571		8,571	2,694
Ordnance Survey Office	1,208	6,824	8,032	4,862
Department of Public Enterprise				
- Geological Survey of Ireland	1,646	7,100	8,746	3,371
- Met Éireann	819	7,697	8,516	6,523
- Radiological Protection Institute of Ireland	194	1,698	1,892	1,699
Department of Social, Community and Family Affairs		15,425	15,425	6,308
State Laboratory		4,938	4,938	4,431
Department of the Taoiseach				
- National Economic and Social Council		597	597	589
Total	**229,284**	**956,737**	**1,186,021**	**950,880**

* Where there are transfers from one S&T agency/department to another the funds are accounted for in the performing agency

** Public funds are exchequer & CSF funds

3.5 Funding by activity

Expenditure on the different S&T activities has been detailed in the previous sections. Figure 4 illustrates how funding of S&T is distributed across the range of activities in 2000, both public and private funds. Education and training accounts for 48% (£528.2m, €670.7m) of the total and research and development accounting for 26% (£290.4m, €368.9m), an increase in real terms of £74.8m (€95m) over 1999.

Figure 5 illustrates the trend in activity funding over time. Education and training has shown an increase from the 1990 level of its percentage of the total expenditure (42%) and research and development has also increased from its share in 1990 (23%).

Figure 4: 2000 Distribution of S&T funding by S&T activity (including earned income)

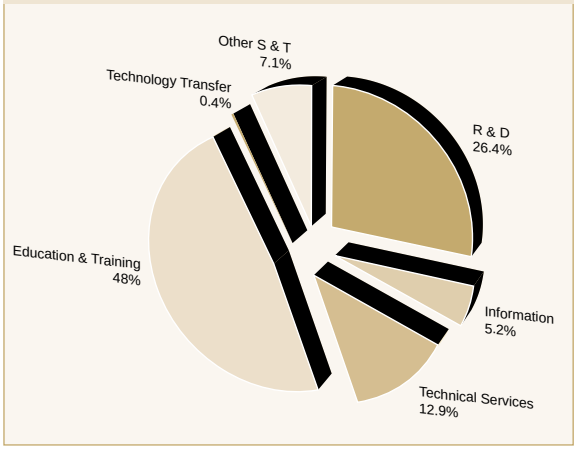
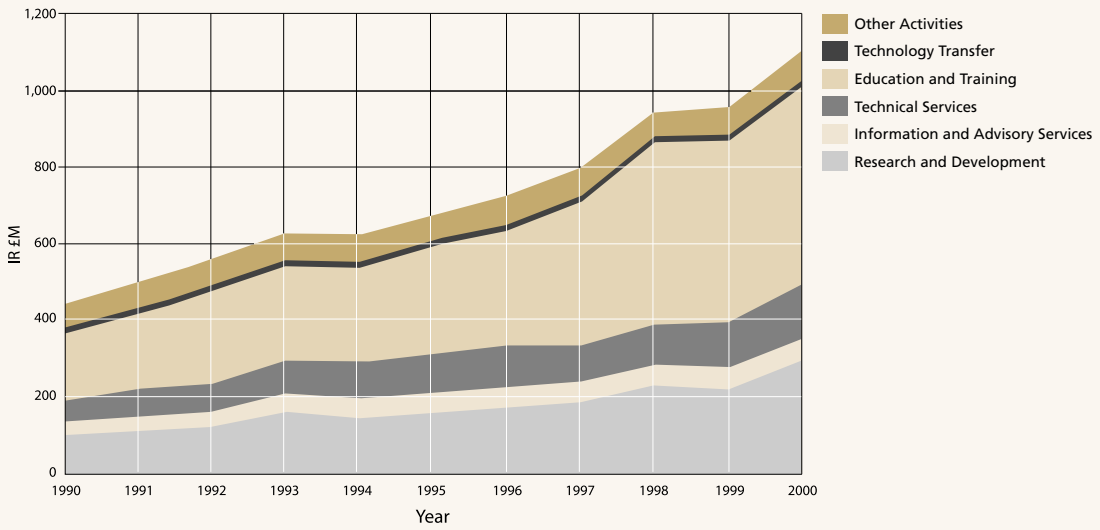


Figure 5 *Funding of S&T activities (including earned income) 2000 prices, £m*



3.6 Public Funding Trends by Objective

Table 6 examines how the different objectives have been funded since 1990.

It can be seen from this table that there has been a significant increase of over £670m (€850.1m) in public expenditure on science and technology since 1990. The areas of Education and Manpower, Marine and Forestry, Economic and Social, and Health have been the main beneficiaries where the increase over 1990 funding has been four-fold. Industry has had an increase of over £100m (€127m) in funding over the past decade, mainly due to considerable support from the CSF as well as increased exchequer funding.

Education and Manpower have received the majority of their increase in funds from the Exchequer, gaining over £430m (€545.9m) on 1990 funding. A significant increase from the Exchequer is also seen in Agriculture and Marine and Forestry, but perhaps more notable in these cases is the fact that the CSF have allocated funding to these areas in comparison with 1990 where almost all funding came from the Exchequer.

Table 6: *Public expenditure on science and technology by objective, current prices **

		1990 Outturn £'000	1995 Outturn £'000	1999 Outturn £'000	2000 Allocation £'000
Education and Manpower **	CSF Funding	10,276	19,794	44,457	29,598
	Exchequer Funding	136,528	242,338	469,323	566,859
	Total	**146,804**	**262,132**	**513,780**	**596,457**
Industry	CSF Funding	16,685	41,857	52,300	70,156
	Exchequer Funding	25,324	27,093	40,271	75,065
	Total	**42,009**	**68,950**	**92,571**	**145,221**
Agriculture	CSF Funding		8,541	9,777	2,496
	Exchequer Funding	22,297	32,358	45,341	61,855
	Total	**22,297**	**40,899**	**55,118**	**64,351**
General Public Services	CSF Funding			381	375
	Exchequer Funding	22,073	40,177	37,078	55,205
	Total	**22,073**	**40,177**	**37,459**	**55,580**
Marine & Forestry (~)	CSF Funding	193	1,350	3,058	2,419
	Exchequer Funding	4,334	6,440	11,163	17,002
	Total	**4,527**	**7,790**	**14,221**	**19,421**
Environment	CSF Funding	154	666	656	730
	Exchequer Funding	5,256	7,976	10,188	11,870
	Total	**5,410**	**8,642**	**10,844**	**12,600**
Economic and Social	CSF Funding				
	Exchequer Funding	3,976	10,360	8,961	16,642
	Total	**3,976**	**10,360**	**8,961**	**16,642**
Health	CSF Funding				
	Exchequer Funding	3,916	7,094	11,037	16,588
	Total	**3,916**	**7,094**	**11,037**	**16,588**
Energy	CSF Funding	1,040	549	899	954
	Exchequer Funding	1,426	2,215	2,451	4,502
	Total	**2,466**	**2,764**	**3,350**	**5,456**
Transportation	CSF Funding				
	Exchequer Funding	703	1,794	1,628	1,752
	Total	**703**	**1,794**	**1,628**	**1,752**
Total	CSF Funding	28,348	72,757	111,528	106,728
	Exchequer Funding	225,833	377,845	637,441	827,339
	Total	**254,181**	**450,602**	**748,969**	**934,067**

* Public funds are Exchequer + CSF funds

** Funds allocated to research in the higher education sector are accounted in Education and Manpower

~ The Marine area includes freshwater as well as seawater activities

Table 6A: *Public expenditure on science and technology by objective, current prices **

		1990 Outturn €'000	1995 Outturn €'000	1999 Outturn €'000	2000 Allocation €'000
Education and Manpower **	CSF Funding	13,048	25,133	56,449	37,582
	Exchequer Funding	173,355	307,706	595,917	719,762
	Total	**186,403**	**332,839**	**652,366**	**757,344**
Industry	CSF Funding	21,186	53,147	66,407	89,080
	Exchequer Funding	32,155	34,401	51,134	95,313
	Total	**53,340**	**87,548**	**117,541**	**184,393**
Agriculture	CSF Funding		10,845	12,414	3,169
	Exchequer Funding	28,311	41,086	57,571	78,540
	Total	**28,311**	**51,931**	**69,985**	**81,709**
General Public Services	CSF Funding			484	476
	Exchequer Funding	28,027	51,014	47,079	70,096
	Total	**28,027**	**51,014**	**47,563**	**70,572**
Marine & Forestry (~)	CSF Funding	245	1,714	3,883	3,072
	Exchequer Funding	5,503	8,177	14,174	21,588
	Total	**5,748**	**9,891**	**18,057**	**24,660**
Environment	CSF Funding	196	846	833	927
	Exchequer Funding	6,674	10,127	12,936	15,072
	Total	**6,869**	**10,973**	**13,769**	**15,999**
Economic and Social	CSF Funding				
	Exchequer Funding	5,048	13,154	11,378	21,131
	Total	**5,048**	**13,154**	**11,378**	**21,131**
Health	CSF Funding				
	Exchequer Funding	4,972	9,008	14,014	21,062
	Total	**4,972**	**9,008**	**14,014**	**21,062**
Energy	CSF Funding	1,321	697	1,141	1,211
	Exchequer Funding	1,811	2,812	3,112	5,716
	Total	**3,131**	**3,510**	**4,254**	**6,928**
Transportation	CSF Funding				
	Exchequer Funding	893	2,278	2,067	2,225
	Total	**893**	**2,278**	**2,067**	**2,225**
Total	CSF Funding	35,995	92,382	141,608	135,517
	Exchequer Funding	286,749	479,764	809,383	1,050,504
	Total	**322,743**	**572,147**	**950,995**	**1,186,020**

* Public funds are Exchequer + CSF funds

** Funds allocated to research in the higher education sector are accounted in Education and Manpower

~ The Marine area includes freshwater as well as seawater activities

3.7 Matrix of Science & Technology funding sources

Figure 6 illustrates the funding sources for all S&T activities comprising the science and technology budget.

This Figure identifies the sectors in receipt of Government funds for research and development. Indirect government funds for research in the third level sector is derived from the HEA's grant-in-aid to academic departments in the universities. In 2000 it is an estimated £22.1m (€28.1m) compared to the direct public (exchequer and CSF funds) funding of research in all third level colleges which amounts to £102.9m (€130.7m). The business sector also provides funds for research in the third level sector and the figures quoted here refer to business funds, which match public funds for joint third level-industry research.

CSF funds are allocated to support R&D in the business sector to the value of £40.1m (€50.9m) compared to direct exchequer support of £5.0m (€6.4m). Income from other sources for research is indicated. Receipts from EU contracts and business account for 18% of the direct funds for research in third level colleges.

3.8 Transfer payments between Departments/Agencies

The science and technology infrastructure is very complex with a range of agencies/departments donating and receiving funds from each other to fund various S&T activities. Table 7 outlines the flows of funds for 2000. Some of these flows come about when agencies are requested to carry out specific activities on behalf of another government institution, while others result from contracts won on a competitive basis.

Figure 6 *Indicative Distribution of Funds for Science and Technology, 2000, £m*

Sources of Funds:	RESEARCH AND DEVELOPMENT						S&T INFO.	TECH. SERVICES	S&T ED. & TRAIN	TECH. TRANSFER	OTHER S&T	TOTAL
	Business £m	Third Level [1] £m	PATS [2] £m	Extramural £m	Government £m	Total £m	£m	£m	£m	£m	£m	£m
Direct Exchequer	5.0	81.5	3.0	9.9	36.8	136.2	32.7	101.7	458.4	1.7	74.5	805.2
Indirect		22.1				22.1						22.1
CSF Funds	40.1	21.4	7.5		5.7	74.7	1.9	3.1	24.4	2.4	0.3	106.8
EU contracts		19.0	1.8		2.5	23.3	0.4	3.0			0.1	26.8
Business		7.0	3.1		5.2	15.3	11.8	11.7	0.1			38.9
Other earned income		12.9	2.3		3.7	18.9	10.6	22.4	45.3		3.4	100.6
Total	45.1	163.9	17.7	9.9	53.9	290.5	57.4	141.9	528.2	4.1	78.3	1100.4

[1] Science and Technology departments only

[2] AMT Ireland is classified under S&T information and technical services

Figure 6A *Indicative Distribution of Funds for Science and Technology, 2000, E m*

Sources of Funds:	RESEARCH AND DEVELOPMENT						S&T INFO.	TECH. SERVICES	S&T ED. & TRAIN	TECH. TRANSFER	OTHE S&T	TOTAL
	Business €m	Third Level [1] €m	PATS [2] €m	Extramural €m	Government €m	Total €m	€m	€m	€m	€m	€m	€m
Direct Exchequer	6.4	103.5	3.8	12.6	46.7	172.9	41.5	129.1	582.1	2.2	94.6	1022.4
Indirect		28.1				28.1						28.1
CSF Funds	50.9	27.2	9.5		7.2	94.9	2.4	3.9	30.9	3.1	0.4	135.6
EU contracts		24.1	2.3		3.2	29.6	0.5	3.8			0.1	34.0
Business		8.9	3.9		6.6	19.4	14.9	14.9	0.1			49.4
Other earned income		16.4	2.9		4.7	24.0	13.5	28.4	57.5		4.3	127.7
Total	57.3	208.1	22.5	12.6	68.4	368.9	72.9	180.2	670.6	5.2	99.4	1397.2

[1] Science and Technology departments only

[2] AMT Ireland is classified under S&T information and technical services

Table 7: *Planned Transfer payments between S&T organisation for S&T activities, 2000, £'000*

From: / To:	Dept Agri-culture	C&RFB	COFORD	Dept. Ent, T & E	Dept. Education	Dept. Pub Ent	Enterprise Ireland	Dept. Environ	Dept. Health	HEA	Dept. Marine	Marine Institute	NRA	SFADCo	Dept Soc Wel	OPW	Teagasc	FÁS	Grand Total
C&RFB												7				110			117
D. I. A. S.				40								15							55
EPA								650											650
ESRI				81	135		43	13	554						261		18	72	1,177
Dept. Education								100											100
Enterprise Ireland			119	49,557		4,480					175	40							54,371
GSI												8							8
HEA	4,593		366	7,600				1,200				260							14,019
HRB									103										103
IDA Ireland				4,000															4,000
Innov Centre														295					295
Marine Institute		191																	191
Met Éireann											25		200						225
NMRC				2,637			965			3,912									7,514
NSAI				3,086															3,086
SFADCo				7,310															7,310
Teagasc	4,514		63					50											4,627
Údarás na G				800															800
Grand Total	**9,107**	**191**	**548**	**75,111**	**135**	**4,480**	**1,008**	**2,013**	**657**	**3,912**	**200**	**330**	**200**	**295**	**261**	**110**	**18**	**72**	**98,648**

Table 7A: *Planned Transfer payments between S&T organisation for S&T activities, 2000, £'000*

From: / To:	Dept Agri-culture	C&RFB	COFORD	Dept. Ent, T & E	Dept. Education	Dept. Pub Ent	Enterprise Ireland	Dept. Environ	Dept. Health	HEA	Dept. Marine	Marine Institute	NRA	SFADCo	Dept Soc Wel	OPW	Teagasc	FÁS	Grand Total
C&RFB												9				140			149
D. I. A. S.				51								19							70
EPA								825											825
ESRI				103	171		55	17	703						331		23	91	1,494
Dept. Education								127											127
Enterprise Ireland			151	62,924		5,688					222	51							69,037
GSI												10							10
HEA	5,832		465	9,650				1,524				330							17,800
HRB									131										131
IDA Ireland				5,079															5,079
Innov Centre														375					375
Marine Institute		243																	243
Met Éireann											32		254						286
NMRC				3,348			1,225			4,967									9,541
NSAI				3,918															3,918
SFADCo				9,282															9,282
Teagasc	5,732		80					63											5,875
Údarás na G				1,016															1,016
Grand Total	**11,564**	**243**	**696**	**95,371**	**171**	**5,688**	**1,280**	**2,556**	**834**	**4,967**	**254**	**419**	**254**	**375**	**331**	**140**	**23**	**91**	**125,257**

4 Science and Technology for the Productive Sectors

Volume 2 of this year's *Science and Technology Budget* presents data on R&D across the whole public sector. In this section we look at other science and technology (S&T) activities, apart from R&D, which are performed in support of the productive sectors of the economy. The sectors considered are industry, agriculture, environment, energy, transport and the marine & forestry areas.

4.1 Industry

Table 8 shows the S&T allocations (including earned income) to various government departments and agencies to support industrial activity. FÁS accounts for over 40% of the total (£28.3m, €35.9m) providing industrial training programmes. The substantial increase in S&T training expenditure by FÁS is highlighted when one looks at FÁS's 1997 figure of £9.5m (€12.1m) (current prices).

The necessity for such investment is emphasised in the National Competitiveness Council report - 'The Competitiveness Challenge 2000': "Human capital, embodied in people, is the vital strategic resource in the increasingly knowledge-based modern economy. Pervasive skill and labour shortages are increasing the risk of overheating and a much sharper than expected economic slowdown".

Enterprise Ireland accounts for about one fifth of the total, providing a range of services in industrial technologies for enterprises as well as aids to technology transfer through its Technology Transfer and Partnerships programme and the Technology Placements programmes (Techstart and Techman).

Table 8: *2000 Science & Technology Allocations (including earned income) by Industry objective*

	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
Agency/Department	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**
	% activity	**% activity**	**% activity**	**% activity**	**% activity**	**% activity**	**% change**
FÁS			28,296			28,296	21,148
			100%			100%	34%
Enterprise Ireland	1,819	5,846	1,000	3,550	780	12,994	13,454
	14%	45%	8%	27%	6%	100%	-3%
NSAI		10,861				10,861	10,599
		100%				100%	2%
Dept. of Enterprise, Trade & Employment	437	200			5,384	6,021	6,006
	7%	3%			89%	100%	0%
National Microelectronics Research Centre		3,912				3,912	970
		100%				100%	303%
Patents Office	2,593				305	2,898	3,039
	89%				11%	100%	-5%
Teagasc	1,268	877				2,145	2,022
	59%	41%				100%	6%
Shannon Development			1,750			1,750	1,633
			100%			100%	7%
Innovation Centre	565					565	550
	100%					100%	3%
Forfás (inc. NAB)		483				483	465
		100%				100%	4%
National Microelectronics Applications Centre	32	42	42	21	21	158	186
	20%	27%	27%	13%	13%	100%	-15%
Total	**6,714**	**22,221**	**31,088**	**3,571**	**6,490**	**70,083**	**60,072**
	10%	**32%**	**44%**	**5%**	**9%**	**100%**	**17%**

Table 8A: *2000 Science & Technology Allocations (including earned income) by Industry objective*

Agency/Department	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
	€'000	€'000	€'000	€'000	€'000	€'000	€'000
	% activity	% activity	% activity	% activity	% activity	% activity	% change
FÁS			35,928			35,928	26,852
			100%			100%	34%
Enterprise Ireland	2,310	7,423	1,270	4,507	990	16,500	17,083
	14%	45%	8%	27%	6%	100%	-3%
NSAI		13,791				13,791	13,458
		100%				100%	2%
Dept. of Enterprise, Trade & Employment	555	254			6,836	7,645	7,626
	7%	3%			90%	100%	0%
National Microelectronics Research Centre		4,967				4,967	1,232
		100%				100%	303%
Patents Office	3,292				387	3,680	3,859
	89%				11%	100%	-5%
Teagasc	1,610	1,114				2,724	2,567
	59%	41%				100%	6%
Shannon Development			2,222			2,222	2,073
			100%			100%	7%
Innovation Centre	717					717	698
	100%					100%	3%
Forfás (inc. NAB)		613				613	590
		100%				100%	4%
National Microelectronics Applications Centre	41	53	53	27	27	201	236
	20%	27%	27%	13%	13%	100%	-15%
Total	**8,524**	**23,214**	**39,474**	**4,534**	**8,241**	**88,987**	**76,276**
	10%	**32%**	**44%**	**5%**	**9%**	**100%**	**17%**

4.2 Agriculture

Table 9 shows the S&T allocations (including earned income) to government departments and agencies to support activities in the agriculture area. The players here are the Department of Agriculture and Food (53%) and Teagasc (47%). The Department operates a number of veterinary laboratories, three dairy science laboratories, as well as classification, testing and certification schemes in relation to meat and crop production. Teagasc provides professional advice to farmer clients at enterprise level dealing with dairying, cattle, tillage crops, horticulture, financial management, agri-tourism, farm modernization, environmental conservation/control of farm pollution, winter feed quality and overall farm management. Program support includes the provision of specialist training to advisers to enable them to keep abreast of S&T developments.

Table 9: *2000 Science & Technology Allocations (including earned income) by Agriculture objective*

	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
Agency/Department	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**
	% activity	**% activity**	**% activity**	**% activity**	**% activity**	**% activity**	**% change**
Teagasc	27,533	2,139				**29,672**	**28,706**
	93%	7%				100%	3%
Department of Agriculture & Food	2,613	30,802				**33,415**	**23,252**
	8%	92%				100%	44%
Total	**30,146**	**32,941**				**63,087**	**51,958**
	48%	**52%**				**100%**	**21%**

Table 9A: *2000 Science & Technology Allocations (including earned income) by Agriculture objective*

	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
Agency/Department	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**
	% activity	**% activity**	**% activity**	**% activity**	**% activity**	**% activity**	**% change**
Teagasc	34,960	2,716				**37,676**	**36,449**
	93%	7%				100%	3%
Department of Agriculture & Food	3,318	39,110				**42,428**	**29,524**
	8%	92%				100%	44%
Total	**38,278**	**41,826**				**80,104**	**65,973**
	48%	**52%**				**100%**	**21%**

4.3 Environment

Table 10 shows the science and technology allocations (including earned income) for activities broadly categorised as environment-related. The major components are the specialist advice, monitoring and laboratory services and other activities of the Environmental Protection Agency and the Radiological Protection Institute of Ireland, as well as the technical services in environment management of Enterprise Ireland and Teagasc.

Table 10: *2000 Science & Technology Allocations (including earned income) by Environmental objective*

Agency/Department	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
	£'000	£'000	£'000	£'000	£'000	£'000	£'000
	% activity	% activity	% activity	% activity	% activity	% activity	% change
Environmental Protection Agency	1,259	9,801				**11,060**	**10,105**
	11%	89%				100%	9%
Enterprise Ireland	44	2,163				**2,207**	**2,415**
	2%	98%				100%	-9%
Radiological Protection Institute of Ireland	619	309				**928**	**872**
	67%	33%				100%	6%
Dept. of Arts, Heritage, Gaeltacht & the Islands		540				**540**	**759**
		100%				100%	-29%
Teagasc	55	38				**93**	
	59%	41%				N/A	
Dept. of the Environment & Local Government	31	51				**82**	**79**
	38%	62%				100%	4%
Total	**2,008**	**12,902**				**14,910**	**14,230**
	13%	**87%**				**100%**	**5%**

Table 10A: *2000 Science & Technology Allocations (including earned income) by Environmental objective*

Agency/Department	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
	€'000	€'000	€'000	€'000	€'000	€'000	€'000
	% activity	% activity	% activity	% activity	% activity	% activity	% change
Environmental Protection Agency	1,599	12,445				**14,043**	**12,831**
	11%	89%				100%	9%
Enterprise Ireland	56	2,747				**2,802**	**3,066**
	2%	98%				100%	-9%
Radiological Protection Institute of Ireland	786	392				**1,178**	**1,107**
	67%	33%				100%	6%
Dept. of Arts, Heritage, Gaeltacht & the Islands		686				**686**	**964**
		100%				100%	-29%
Teagasc	70	48				**118**	
	59%	41%				N/A	
Dept. of the Environment & Local Government	39	65				**104**	**100**
	38%	62%				100%	4%
Total	**2,549**	**16,382**				**18,932**	**18,068**
	13%	**87%**				**100%**	**5%**

4.4 Marine and Forestry

Table 11 shows the science and technology allocations (including earned income) for activities in the marine, fisheries and forestry areas.

Scientific and technical services now accounts for 76% of the total expenditure with the majority of the spending undertaken by the Marine Institute. The Marine Institute provides a data and information management service which aims to strengthen the overall quality, service and performance of marine data and information management at both national and international level.

An Bord Iascaigh Mhara's training programmes are geared to developing practical skills with respect to efficiency, safety, and management functions in order to support the maintenance and expansion of sustainable employment in sea fishing, aquaculture, processing and distribution.

Enterprise Ireland, in the forestry section, provides technical advice, consultancy services, training and assistance with new products, and process development was provided to the Irish timber industry to identify opportunities for Irish timber and develop new applications and standards.

Table 11: *2000 Science & Technology Allocations (including earned income) by Marine & Natural Resources objective*

	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
Agency/Department	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**
	% activity	**% activity**	**% activity**	**% activity**	**% activity**	**% activity**	**% change**
Marine Institute		6,712				**6,712**	**9,320**
		100%				100%	-28%
Bord Iascaigh Mhara		53	1,761		670	**2,484**	**2,258**
		2%	71%		27%	100%	10%
Central and Regional Fisheries Board		1,200				**1,200**	**1,420**
		100%				100%	-15%
Enterprise Ireland	69	696				**765**	**812**
	9%	91%				100%	-6%
COFORD				80	212	**292**	**190**
				27%	73%	100%	54%
Total	**69**	**8,661**	**1,761**	**80**	**882**	**11,453**	**14,000**
	1%	**76%**	**15%**	**1%**	**8%**	**100%**	**-18%**

Table 11A: *2000 Science & Technology Allocations (including earned income) by Marine & Natural Resources objective*

	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
Agency/Department	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**
	% activity	**% activity**	**% activity**	**% activity**	**% activity**	**% activity**	**% change**
Marine Institute		8,522				**8,522**	**11,834**
		100%				100%	-28%
Bord Iascaigh Mhara		67	2,236		851	**3,154**	**2,867**
		2%	71%		27%	100%	10%
Central and Regional Fisheries Board		1,524				**1,524**	**1,803**
		100%				100%	-15%
Enterprise Ireland	88	884				**971**	**1,031**
	9%	91%				100%	-6%
COFORD				102	269	**371**	**241**
				27%	73%	100%	54%
Total	**88**	**10,997**	**2,236**	**102**	**1,120**	**14,542**	**17,776**
	1%	**76%**	**15%**	**1%**	**8%**	**100%**	**-18%**

4.5 Energy

Table 12 shows science and technology allocations (including earned income) for activities related to energy. The major element here is the energy technology promotion activities of the Irish Energy Centre in Enterprise Ireland. The Department of Marine and Natural Resources operate an Exploration and Mining Division and a Petroleum Affairs Division, which provides the technical expertise necessary for promotion, monitoring and controlling of petroleum exploration and development activities by private enterprise under licence to the Department.

Table 12: *2000 Science & Technology Allocations (including earned income) by Energy objective*

	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
Agency/Department	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**
	% activity	**% activity**	**% activity**	**% activity**	**% activity**	**% activity**	**% change**
Enterprise Ireland	3,910	670				**4,580**	**3,082**
	85%	15%				100%	49%
Department of Marine & Natural Resources	1,043	121	5		18	**1,187**	**500**
	88%	10%	<1%		2%	100%	137%
Total	**4,953**	**791**	**5**		**18**	**5,767**	**3,582**
	86%	**14%**	**<1%**		**<1%**	**100%**	**61%**

Table 12A: *2000 Science & Technology Allocations (including earned income) by Energy objective*

	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
Agency/Department	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**
	% activity	**% activity**	**% activity**	**% activity**	**% activity**	**% activity**	**% change**
Enterprise Ireland	4,965	851				**5,815**	**3,913**
	85%	15%				100%	49%
Department of Marine & Natural Resources	1,324	154	6		23	**1,507**	**635**
	88%	10%	<1%		2%	100%	137%
Total	**6,289**	**1,005**	**6**		**23**	**7,322**	**4,548**
	86%	**14%**	**<1%**		**<1%**	**100%**	**61%**

4.6 Transportation

Table 13 shows science and technology allocations (including earned income) in support of national transportation objectives. The activity relates to the work of the National Roads Authority in planning and supervising the construction, improvement and maintenance of network of national roads. It amounts to £1.3m (€1.65m) overall.

Table 13: *2000 Science & Technology Allocations (including earned income) by Transportation*

	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
Agency/Department	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**
	% activity	**% activity**	**% activity**	**% activity**	**% activity**	**% activity**	**% change**
National Roads Authority	243	920	68	59		**1,290**	**1,225**
	19%	71%	5%	5%		100%	5%

Table 13A: *2000 Science & Technology Allocations (including earned income) by Transportation*

	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
Agency/Department	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**
	% activity	**% activity**	**% activity**	**% activity**	**% activity**	**% activity**	**% change**
National Roads Authority	309	1,168	86	75		**1,638**	**1,555**
	19%	71%	5%	5%		100%	5%

5 Education and Health Activities

The S&T Budget incorporates data relating to scientific and technological activities undertaken in a broader social context. The major components of this relate to educational and health activities.

Table 14 shows the science and technology allocations (including earned income) for education and training activities. The administering of funding by The Higher Education Authority and the Department of Education and Science for S&T courses, in the universities and institutes of technology respectively, are the major performers.

The total allocation for Education and Training (including earned income) in 2000 is £533.6m (€677.6m) an increase of £34.9m (€44.3m) over the 1999 figure. This increase is mainly due to the additional allocations by the Department of Education and Science via the Higher Education Authority (HEA) of £31m (€39.4m) for research in third level institutions. This is an increase in real terms of 9% over the 1999 HEA figure.

Table 14: *2000 Science and Technology Allocations (including earned income) by Education & Training objective*

Agency/Department	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
	£'000	£'000	£'000	£'000	£'000	£'000	£'000
	% activity	% activity	% activity	% activity	% activity	% activity	% change
Department of Education & Science			275,398		128	**275,526**	**272,633**
			100%		<1%	100%	1%
Higher Education Authority			196,444		58,237	**254,681**	**223,022**
			77%		23%	100%	14%
Postgraduate Medical & Dental Board			2,857			**2,857**	**2,524**
			100%			100%	13%
Dublin Institute for Advanced Studies	60				525	**585**	**543**
	10%				90%	100%	8%
Total	**60**		**474,699**		**58,890**	**533,649**	**498,722**
	<1%		**89%**		**11%**	**100%**	**7%**

Table 14A: *2000 Science and Technology Allocations (including earned income) by Education & Training objective*

Agency/Department	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
	€'000	€'000	€'000	€'000	€'000	€'000	€'000
	% activity	% activity	% activity	% activity	% activity	% activity	% change
Department of Education & Science			349,683		162	**349,845**	**346,172**
			100%		<1%	100%	1%
Higher Education Authority			249,432		73,946	**323,378**	**283,179**
			77%		23%	100%	14%
Postgraduate Medical & Dental Board			3,628			**3,628**	**3,205**
			100%			100%	13%
Dublin Institute for Advanced Studies	76				667	**743**	**689**
	10%				90%	100%	8%
Total	**76**		**602,743**		**74,775**	**677,594**	**633,245**
	<1%		**89%**		**11%**	**100%**	**7%**

Activities in the area of *health* are shown in Table 15. Science and technology activities in the Health sector are dominated by the activities of the Department of Health and Children. In the Department of Health and Children, the scientific and technical services of £5.0m (€6.4m) relates mainly to the activities of the Irish Medicines Board, which is self-funding from earned income and receives no public funds.

The Department employs consultants to study and advise on various aspects of the health services. The Food Advisory Committee advises on matters relating to the composition, description, manufacture, processing, labelling and advertising of food. The Department participates in the S&T activities of the World Health Organisation and other international organisations.

The National Cancer Registry Board researches and analyses information relating to the incidence and prevalence of cancer and related tumours in Ireland and promotes and facilitates the use of data collected in approved research projects and in planning and management of services.

Table 15: *2000 Science & Technology Allocations (including earned income) by Health objective*

	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
Agency/Department	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**
	% activity	**% activity**	**% activity**	**% activity**	**% activity**	**% activity**	**% change**
Health Research Board		388	55			**443**	**330**
		88%	12%			100%	34%
Dept. of Health & Children	5,706	5,134			21	**10,861**	**9,381**
	53%	47%			<1%	100%	16%
Radiological Protection	385	385				**770**	**716**
Institute of Ireland	50%	50%				100%	7%
Total	**6,091**	**5,907**	**55**		**21**	**12,074**	**10,427**
	50%	**49%**	**<1%**		**<1%**	**100%**	**16%**

Table 15A: *2000 Science & Technology Allocations (including earned income) by Health objective*

	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
Agency/Department	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**
	% activity	**% activity**	**% activity**	**% activity**	**% activity**	**% activity**	**% change**
Health Research Board		493	70			**563**	**419**
		88%	12%			100%	34%
Dept. of Health & Children	7,245	6,519			27	**13,791**	**11,911**
	53%	47%			<1%	100%	16%
Radiological Protection Institute of Ireland	489	489				**978**	**909**
	50%	50%				100%	7%
Total	**7,734**	**7,500**	**70**		**27**	**15,331**	**13,239**
	50%	**49%**	**<1%**		**<1%**	**100%**	**16%**

6 General Public Service Activities

This area is concerned with science and technology activities undertaken by the Government in support of regulatory and statutory activities. These are listed in Table 16.

Met Éireann provides meteorological information on a routine basis to the media and the general public. More detailed information and special advice is also available directly to agricultural and marine interests, for legal and commercial purposes, to the aviation sector, for off-shore oil exploration and to other specialised interests as required. A warning service is provided for gales and other weather phenomena of a hazardous nature. Much of this information is supplied on a commercial basis. The Service also makes available a wide range of climatological and geophysical data in the form of bulletins, brochures and regular publications.

Table 16: *2000 Science & Technology Allocations (including earned income) by General Public Services objective*

Agency/Department	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
	£'000	£'000	£'000	£'000	£'000	£'000	£'000
	% activity	% activity	% activity	% activity	% activity	% activity	% change
Central Statistics Office		23,426				**23,426**	**18,651**
		100%				100%	26%
Met Éireann	5,246	5,157	386	246	411	**11,446**	**9,778**
	46%	45%	3%	2%	4%	100%	17%
Ordnance Survey		11,190				**11,190**	**9,895**
		100%				100%	13%
Geological Survey		7,098				**7,098**	**2,836**
Of Ireland		100%				100%	150%
Office of Public Works					4,250	**4,250**	**2,122**
					100%	100%	100%
State Laboratory		3,850	39			**3,889**	**3,490**
		99%	1%			100%	11%
Dept. of the Environment		1,225	8			**1,233**	**1,085**
& Local Government		99%	1%			100%	14%
Forfás	1,114					**1,114**	**973**
	100%					100%	14%
Radiological Protection	119	121				**240**	**235**
Institute of Ireland	50%	50%				100%	2%
Total	**6,479**	**52,067**	**433**	**246**	**4,661**	**63,886**	**49,065**
	10%	**82%**	**1%**	**<1%**	**7%**	**100%**	**30%**

Table 16A: *2000 Science & Technology Allocations (including earned income) by General Public Services objective*

Agency/Department	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
	€'000	€'000	€'000	€'000	€'000	€'000	€'000
	% activity	% activity	% activity	% activity	% activity	% activity	% change
Central Statistics Office		29,745				**29,745**	**23,682**
		100%				100%	26%
Met Éireann	6,661	6,548	490	312	522	**14,533**	**12,415**
	46%	45%	3%	2%	4%	100%	17%
Ordnance Survey		14,208				**14,208**	**12,564**
		100%				100%	13%
Geological Survey		9,013				**9,013**	**3,601**
Of Ireland		100%				100%	150%
Office of Public Works					5,396	**5,396**	**2,694**
					100%	100%	100%
State Laboratory		4,888	49			**4,938**	**4,431**
		99%	1%			100%	11%
Dept. of the Environment		1,555	10			**1,565**	**1,378**
& Local Government		99%	1%			100%	14%
Forfás	1,414					**1,414**	**1,235**
	100%					100%	14%
Radiological Protection	151	154				**305**	**298**
Institute of Ireland	50%	50%				100%	2%
Total	**8,227**	**66,111**	**550**	**312**	**5,918**	**81,118**	**62,300**
	10%	**82%**	**1%**	**<1%**	**7%**	**100%**	**30%**

7 Economic and Social Activities

This area is concerned with science and technology activities undertaken by the Government in support of economic and social activities. These are listed in Table 17.

Table 17: *2000 Science and Technology Allocations (including earned income) by Economic & Social objective*

	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
Agency/Department	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**	**£'000**
	% activity	**% activity**	**% activity**	**% activity**	**% activity**	**% activity**	**% change**
Economic and Social	210	1,271	30			**1,511**	**1,377**
Research Institute	14%	84%	2%			100%	10%
Dept. of Social, Community	395		19		935	**1,349**	**1,345**
And Family Affairs	29%		1%		69%	100%	0%
Natural History Museum			1			**1**	**1**
			100%			100%	<1%
Total	**605**	**1,271**	**50**		**935**	**2,861**	**2,723**
	21%	**44%**	**2%**		**33%**	**100%**	**5%**

Table 17A: *2000 Science and Technology Allocations (including earned income) by Economic & Social objective*

	Information & Specialist Advisory Services	Scientific and Technical Services	Education and Training	Technology Transfer	Other Activities	Total	1999 Outturn
Agency/Department	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**	**€'000**
	% activity	**% activity**	**% activity**	**% activity**	**% activity**	**% activity**	**% change**
Economic and Social	267	1,614	38			**1,918**	**1,748**
Research Institute	14%	84%	2%			100%	10%
Dept. of Social, Community	501		24		1,187	**1,713**	**1,708**
And Family Affairs	29%		1%		69%	100%	<1%
Natural History Museum			1			**1**	**1**
			100%			100%	0%
Total	**768**	**1,614**	**63**		**1,187**	**3,632**	**3,457**
	21%	**44%**	**2%**		**33%**	**100%**	**5%**

Science and technology activities in the Economic and Social sector are dominated by the activities of the Department of Social, Community and Family Affairs and the Economic and Social Research Institute (ESRI). The ESRI activities include research in economic forecasting and modelling, economic growth, the international environment, regional issues, the public sector, prices and incomes, demography and labour, social policy, values and attitudes, data and methodology. It also undertakes commissioned studies, surveys and data analysis on behalf of outside organisations and provides training in research for young graduates.

Appendix 1

Methodology & Definitions

Appendix 1: Methodology and Definitions

Methodological Note

The information given in this document relates to 42 institutions in receipt of monies from the exchequer for the performance or support of scientific, technological and related activities in every field and is based on the information supplied by these institutions.

In order to ensure consistency of analysis the database has been adjusted back to 1990 to take account of changes that agencies/departments have recorded.

In general, institutions and information relating to them are listed separately. In a few cases an institution is listed with its parent department or organisation but identified separately. Where practicable the programmes of the various institutions have been separated and categorised in accordance with international practice into relevant scientific and technological activities i.e.:

- research and development (R&D)
- information and specialist advisory services
- scientific and technical services
- training (including courses) and
- technology transfer.

However, in many instances, especially in institutions with few staff, institutions operate several programmes jointly, sharing resources in an administratively appropriate unit. In these circumstances the programmes, as described here, do not represent truly independent programmes. Consequently, the data should be interpreted with caution if expansions or contractions are being considered.

Expenditure data for specific programmes refer to the 1999 outturn costs of programmes and to the expected costs in 2000. The outturn costs are mainly funded by matching grant-in-aid or voted monies. Where programmes are funded in other ways these monies are noted separately. In these instances the expenditure (cost) data shown includes both exchequer and other income contributions.

Expenditures are based on unaudited figures, except in a few cases where they are identical with a Vote by the Oireachtas. For convenience, general overheads, where shown, are distributed in proportion to programmes' expenditures. Programmes are attributed to the institution most directly involved, that is to those actually operating them, but not necessarily funding them. An example of the latter is the Department of Enterprise, Trade and Employment, which funds, but does not operate or manage many programmes. Only their own administrative costs are attributed to the funding institutions in such cases.

Numbers of staff involved on individual S&T programmes are shown only where a reasonable subdivision is possible. Where institutions are involved in funding a large number of external R&D (or similar) personnel, data on these external personnel are not given.

In some cases it is possible to give an indication of output, e.g. numbers of grants awarded, samples analysed etc. per annum. The information given relates to 2000 unless otherwise stated.

Apportionment problems arise in the third level sector (mainly the monies distributed by the Higher Education Authority and the Department of Education to institutes of technology). In the case of the HEA, total funds are first apportioned between S&T faculties and non-S&T faculties in the colleges. (Expenditure on non-S&T faculties is not included in this document).

The extent and cost of the R&D work undertaken in colleges, and funded out of the HEA's general block grant, is determined indirectly from surveys of academic staff in colleges. These surveys are carried out by Forfás on a multi-annual basis and the corresponding cost data are, of necessity, based on historical estimates. The HEA funding of academic departments was isolated from administration and support services within colleges. Co-efficients of research time derived from Forfás surveys are now applied to funding of academic departments only, not including the administration and support services as had been included in the past. In the case of ITs, costs are apportioned between S&T departments and second level activities; the latter are not included.

Definitions of S&T Activities

i) **Research:** Original, experimental or theoretical investigations under-taken to acquire new knowledge, with or without a particular application or use in view.

ii) **Development:** Systematic work drawing on existing knowledge gained from research and/or practical experience, that is directed to producing new products, processes, systems, services, varieties and breeds and to improving substantially already existing ones. Data collection conducted solely or primarily as part of the research and development (R&D) process included under "research" or "development" as appropriate.

iii) **Information and Specialist Advisory Services:** Provision of information via **formalised scientific and technical information and documentation (STID) services** includes all expenditure (manpower and materials) involved in acquiring, controlling or transmitting information to users with the involvement of staff whose primary function is in formalised STID services, e.g. provision of S&T information, advice, liaison.

Specialist advice, information analysis, libraries, publications and documentation services, translations, technical seminars and conferences. Provision of information **via non-formalised STID services** includes expenditures on providing know how and expertise by members of staff who, while not specifically engaged in formalised STID services, provide specialist advice, liaison, consultancy or other general information services.

iv) **Technical Services:** Specialised support services of a scientific or technical nature generally provided by centralised laboratories or facilities, and can be of a routine or non-routine nature. Essentially they comprise the technical back-up analytical, diagnostic and data collection/processing services.

v) **Training:** Education and training of third level or equivalent students in science and technology disciplines.

vi) **Technology Transfer:** Activities which are directed solely or primarily towards the transfer and adoption of new technology, generally in enterprises. The horizontal transfer of technology, primarily from abroad, but also from colleges to enterprises is included here.

vii) **Other S&T Activities:** Activities which cannot be conveniently grouped under the above headings can be included here e.g. grants to international organisations, policy planning units etc.

viii) **Extramural Expenditure:** Monies spent on S&T activities carried out on behalf of the reporting institution by a third party.

Other Definitions

ix) **Third Level Education:** All Universities and Institutes of Technology.

x) **Public Funds**: Exchequer monies and funds from the Community Support Framework.

Appendix 2

Index of Acronyms

Appendix 2: Index of Acronyms

BIM	Bord Iascaigh Mhara - The Irish Sea Fisheries Board
C&RFB	Central and Regional Fisheries Boards
COFORD	National Council for Forest Research and Development
CSF	Community Support Framework
CSO	Central Statistics Office
DACG	Department of Arts, Heritage, Gaeltacht and the Islands
Dagri	Department of Agriculture and Food
Deduc	Department of Education and Science
Dept Ent, T & E	Department of Enterprise, Trade and Employment
Dept Environ	Department of the Environment and Local Government
Dept Pub Ent	Department of Public Enterprise
DIAS	Dublin Institute for Advanced Studies
DMar	Department of the Marine and Natural Resources
Dept Soc Wel	Department of Social, Community and Family Affairs
EAGGF	European Agriculture Guidance and Guarantee Fund
EPA	Environmental Protection Agency
ERDF	European Regional Development Fund
ESF	European Social Fund
ESRI	Economic and Social Research Institute
EU	European Union
FÁS	FÁS - the National Training and Employment Authority
Forfás	Forfás - the National Policy and Advisory Board for Enterprise, Trade, Science, Technology and Innovation
GSI	Geological Survey of Ireland
HEA	Higher Education Authority
HRB	Health Research Board
IDA Ireland	Industrial Development Agency Ireland
Innov Centre	Innovation Centre
MAC	National Microelectronics Applications Centre
NAB	National Accreditation Board
NESC	National Economic and Social Council
NMRC	National Microelectronics Research Centre
NRA	National Roads Authority
NSAI	National Standards Authority of Ireland
OPW	Office of Public Works
OST	Office of Science and Technology - Department of Enterprise, Trade and Employment
RPII	Radiological Protection Institute of Ireland
SFADCo	Shannon Development
Údarás na G	Údarás na Gaeltachta

Appendix 3

Institutions' Programmes

Appendix 3: Institutions' Programmes

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Department of Agriculture and Food

The Department of Agriculture, Food and Rural Development is concerned with the development of the agriculture and food industries, through administration of public services in connection with promotion of farm improvement, participation in international agricultural activities, including administration of EU schemes, and UN agency activities.

The Department is responsible for the operation of land policy. The Department operates a number of testing centres and laboratories, in the areas of veterinary diagnostics and research, meat control, seed testing, plant variety testing, cattle performance testing, pesticide control and dairy products control. State-sponsored bodies which come under the statutory responsibility of the Minister for Agriculture, Food and Rural Development include Teagasc - the Agriculture and Food Development Authority, An Bord Bia, Bord Glas.

The main national aims are to improve quality and productivity and to encourage better market orientation in farming, through training, research and advisory measures and to encourage Teagasc to undertake a strategic review in this regard. These aims are reflected in the following areas:

Rural Development

The Department is committed to a wider view of rural development, which embraces both farm and other enterprises in rural areas, and which is focused on addressing the issue of rural poverty and the promotion of a vibrant economy in rural areas. This commitment includes support for research on rural development issues.

Environment

The need to develop a more fully integrated policy on agriculture and the environment is one of the key challenges for the Department. The Control of Farm Pollution measure, the Rural Environment Protection Scheme and the Organic Farming Development Scheme are the principal means by which the Department is trying to encourage more environmentally friendly farming. Education and training courses run by Teagasc are being used to promote greater consideration for the environment.

Food Safety

The Department is committed to implementing a safety and quality assurance regime by controlling veterinary medicines and plant protection products. In addition, the Department operates appropriate food safety monitoring, surveillance and inspection programmes under a service contract with the Food Safety Authority of Ireland. To achieve this goal, the Department's meat and dairy inspection services have a presence in processing and storage plants throughout the country. As a back-up to these services the Department operates three dairy laboratories, a meat laboratory and a pesticides laboratory, where samples of product are analysed for quality and safety. The State Laboratory is also used where necessary.

	£'000	
	1999	2000

International Framework

The Department is committed to contributing to Ireland's international development aid effort through appropriate policy stances at, and financial contributions to, international agricultural organisations (FAO, WFP, IFAD) and through advice and assistance to Irish Aid and Irish NGOs. It also participates in the work of international standard setting bodies concerned with plant protection (IPPC), animal health and welfare (OIE) and food safety and trade (Codex Alimentarius).

Breakdown of the Department's Vote

The Vote for the Department of Agriculture, Food and Rural Development in 2000 is estimated at £615.135m (€781.1m) i.e. a gross total of £902.587m (€1,146.01m) less appropriations-in-aid of £287.114m (€364.56m). General departmental administration costs are estimated at £134m (€170.15m). The grant-in-aid to Teagasc for general expenses (incl. capital) relating to research, training and advisory services is set at £56.092m (€71.22m) for 2000. Teagasc will also receive other public funding in 2000 including approx. £6.7m (€8.5m) Exchequer funds for training under the National Development Plan. It is expected that Teagasc will receive about £4.3m (€5.5m) from the allocation for non-commissioned food research (for which it must compete).

The following is a breakdown of expenditure data which do not include the Department's own general overheads.

Research, Development and Demonstration

Improvement of Crops:

1,658	1,696
(€2,105)	(€2,153)

Improving the quality of crops and crop products through the use of the highest quality varieties and seeds.

The main activities leading to achievement of this objective include the operation of two stations/farms at Ballinacurra in Co. Cork and Backweston in Co. Dublin where plant varieties are evaluated, the operation of a potato laboratory at Raphoe in Co. Donegal and the carrying out of trials in farmers' fields throughout the country.

Veterinary and Meat Laboratory Services

1,289	1,364
(€1,637)	(€1,732)

Operation of a Central Veterinary Research Laboratory at Abbotstown, Co. Dublin, Regional Veterinary Research Laboratories at Cork, Limerick, Sligo, Athlone and a testing laboratory in Waterford.

Receipts amounting to £454,937 (€577,650) were received in respect of the veterinary laboratories in 1999 and £385,000 (€488,849) is expected in 2000.

Institutional Food Research

57	59
(€72)	(€75)

In its implementation of the Institutional Research and Development Measure of the Food Sub-Programme of the Operational Programme for Industrial Development 1994 – 1999 (and follow-on RTDI measures under the National Development Plan 2000 – 2006), the Department is involved in the management of competitive tendering by Food Research Institutions for grant aid to support food research in priority areas. It monitors the progress of successful projects, payment of grant aid and evaluation of the programme.

	£'000 1999	£'000 2000
Agricultural Production Research This is the "Research Stimulus Fund" measure of the Operational Programme for Agriculture, Rural Development and Forestry (OPARDF) which encourages co-operative research in agricultural production. This involves management of competitive tendering by Research Institutions for grant aid to support agricultural research projects in priority areas, monitoring of progress of successful projects, payments of grant aid and evaluation of the programme.	9 (€11)	10 (€13)
Improvement of Livestock Improving the quality of livestock and livestock products through adoption of better breeding and selection practices. The main activities leading to achievement of these objectives are operation of on-farm and central testing stations; recording schemes; collaboration with and support for research in animal breeding at research institutions.	321 (€408)	263 (€334)
Genetic Resources in Plants and Animals Operation of an Advisory Committee on Genetic Resources for use in Agriculture including making recommendations regarding the selection of research projects for the award of grant aid.	46 (€58)	52 (€66)

Information and Advisory Services

Publicity And Library Services: Providing access to information for the staff of the Department and to disseminate science and technology information to farmers, agribusiness and consumers. Operation of a library service at the Headquarters of the Department in Dublin and at various decentralised locations; Participation in the form of having an exhibit/stand at various events such as shows, Agriculture Events, Ploughing Championship etc.; Publication and dissemination of various reports and documents.	165 (€210)	162 (€206)
Genetic Resources in Plants and Animals Promotion of awareness of the need for conserving genetic resources and participation in the FAO Global Programme and EU Programme under Council Regulation (EC) No. 1467/94 related to genetic resources.	14 (€18)	20 (€25)
Land Parcel Identification System (LPIS) The Department is in the latter stages of developing, in association with an outside firm of consultants, a computer based mapping system wherein each land parcel (field) in the country is uniquely identified and has its size, annual usage and ownership/user recorded. Basic information used includes Ordnance Survey maps, declarations of usage and claims for aid made by farmers and aerial photography. This LPIS system is required as part of the EU Integrated Administrative Control System (IACS) but will have multiple uses across many activities of the Department.	2,345 (€2,978)	2,431 (€3,087)

Technical Services

	£'000 1999	£'000 2000
Improvement of Crops:	3,078 (€3,908)	3,184 (€4,043)
Improving the quality of crops and crop products through the use of the highest quality varieties and seeds.		
The main activities leading to achievement of this objective include the publishing of recommended lists of varieties: operation of a seed testing station at Abbotstown, Co. Dublin; operation of seed certification schemes; operation of a laboratory and farm for producing disease free potato foundation breeding stock at Raphoe in Co. Donegal and administration of the international systems of Plant Breeders Rights and Catalogues of Varieties in Ireland.		
Income from crop improvement services – comprising, in the main, receipts from seed testing, certification, licensing, and registration fees - amounted to £979,488 (€1,243,693) in 1999 and is expected to total £958,000 (€1,216,409) in 2000.		
Improvement of Livestock	1,817 (€2,307)	1,491 (€1,893)
Improving the quality of livestock and livestock products through adoption of better breeding and selection practices.		
The main activities leading to achievement of these objectives are data analysis and calculation of breeding value estimates for animals and publication of results; approval of animals for breeding purposes and participation in various international fora related to animal breeding.		
Income relating to these activities – mainly licence/testing fees - amounted to £102, 829 (€130,566) in 1999 and is expected to total £35,000 (€44,440) in 2000.		
National Beef Assurance Scheme	1,230 (€1,562)	9,104 (€11,559)
EU regulations require all Member States to establish a bovine animal traceability system to assure the quality and safety of beef. Under the development phase of this exercise the Department is funding the development of information and communication facilities with all elements of the trade including the installation of IT systems at livestock marts, meat factories and live animal export points throughout the State.		
Classification of Meat Carcasses	1,607 (€2,040)	1,673 (€2,124)
Commission Regulation 1186/90 made it compulsory for all EU approved slaughterhouses to classify cattle slaughtered in accordance with a common Community System. The basic aims of the scheme are:		

- to make price quotations comparable throughout the EU
- to fix the guide price for carcasses on a slaughter weight basis
- to fix a single intervention price throughout the Community for each quality of meat eligible for intervention.

	£'000 1999	£'000 2000
EU Council Regulation 2137/92 provides for the implementation of an EU wide lamb carcass classification scheme which defines lamb carcasses in terms of conformation and fat cover. The classification will be carried out by trained factory personnel and will be monitored by Department staff. Part of the allocation has been spent on training courses for factory personnel and further monies will be spent on publicity of the scheme.		
Analysis Of Feedingstuffs/Fertilisers: Feedingstuff regulations provide that officers of the Department take samples of feedingstuffs/ fertilisers at various locations - farms, distribution centres, manufacturing plant - and these are analysed at the State Laboratory and/or Department laboratories for various characteristics to check on compliance with various standards laid down, declared makeup/ingredients as the case may require.	173 (€220)	226 (€287)
Pesticide Control Service The Pesticide Control Service acts as the regulatory authority for pesticides (plant protection products and biocides) in Ireland. The PCS is responsible for the authorisation or clearance of pesticides for marketing/use and for the control of the levels of pesticide residues remaining in food and feed. All the work of the PCS derives from legislation which, in the main, serves to implement EU Directives. Income from fees was £206,008 (€261,576) in 1999 with £542,000 (€688,198) expected in 2000.	865 (€1,098)	1,053 (€1,337)
Veterinary and Meat Laboratory Services The Department's Central Veterinary and Regional Laboratories and its Central Meat Control Laboratory at Abbotstown, Co. Dublin, provides laboratory support for Department Officers at meat plants. It is primarily engaged in testing for residues of illegal substances, and microbiological testing of samples from meat plants.	7,306 (€9,277)	8,054 (€10,226)
Dairy Science and Testing Service Health protection and quality control measures for milk and dairy products, (i.e., bacteriological and chemical analyses of samples), aimed at the maintenance of quality standards and hygiene in the production of milk and dairy products, as required under Council Directive 92/46/EEC and the implementing legislation are the main functions of the Dairy Science Laboratories. In addition to operation of the three Dairy Science Laboratories (in Dublin, Cork and Limerick), the Department operates a Dairy Inspection Service whereby farms, processing facilities and products are inspected and certified as meeting various standards laid down. The dairy inspection levy of an amount per gallon of milk supplied by farmers (currently 0.358p per gallon) is collected by milk purchasers and is calculated to cover all costs of the dairy laboratory and dairy inspection services. The Dairy Inspection Fee which yielded £3.9m (€5m) in 1999 and estimated at £4.3m (€5.4m) in 2000 is intended to recoup the cost not only of these laboratories but also of the entire dairy inspection and control regime.	3,753 (€4,765)	3,887 (€4,935)

	£'000	
	1999	2000
Genetic Resources in Plants and Animals	47	63
	(€60)	(€80)
Development and conservation in the area of genetic resources for use in agriculture. Applied developmental research designed to identify non-compliance with specified criteria relating to relevant plant species/varieties and animal breeds.		
Organic Farming	85	100
	(€108)	(€127)
The Department supports the development of organic farming through grant-aid support to the organic farming organisations such as IOFGA (Irish Organic Farmers and Growers Association) and technical support on the part of its own staff with a primary aim of ensuring the provision of an inspection service for the granting of approved organic farming status.		
Under the Operational Programme of Agriculture, Rural Development and Forestry development of Organic Farming is supported by the allocation of grant-aid for the provision of grading, packing storage and distribution facilities for organic produce and for marketing and support of organic farming practices (Measure 3, Sub-measure (e)).		

Extramural Payments

International Co-operation	877	948
	(€1,114)	(€1,204)
Co-operation in international technical programmes is the main purpose of this activity. Expenditure covers membership contributions to international organisations including: the Food and Agriculture Organisation of the United Nations (FAO); the European and Mediterranean Plant Protection Organisation (EPPO); the Union for the Protection of New Varieties of Plants (UPOV); the International Veterinary Bureau (OIE); the European Association for Animal Production (EAAP) and the FAO/European Co-operative Programme for Plant Genetic Resources (ECP/PGR). Participation in FAO Associate Professional Officer Scheme is also funded.		
Improvement of Livestock	903	1,967
	(€1,147)	(€2,498)
Extramural payments by the Department relate mainly to transfers to the Irish Cattle Breeding Federation and the Irish Horse Board Co-op. These are used to fund the administration costs of these organisations as well 'technical service' type schemes aimed at improving the quality and genetic merit of cattle and sport horses in Ireland.		

Transfers to Other Government Agencies

In general, funds transferred by the Department to other Government agencies comprise grant payments to Teagasc and third level institutions for R&D activities under (1) the Institutional Food Research Programme, (2) the Research Stimulus Fund and (3) the Irish side of the U.S./Ireland Co-operation Programme in Agricultural Science and Technology.

Funding received from the Department by these agencies included in the science budget are accounted for in the relevant programme descriptions.

Teagasc

Teagasc - the Agriculture and Food Development Authority - is the national body providing advisory, research, education and training services to the agriculture and food industry. It was established under the Agriculture (Research, Training and Advice) Act, 1988.

An eleven-member Authority governs Teagasc. The Minister for Agriculture, Food and Rural Development appoints the Chairperson and five ordinary members. The Minister, following nominations from designated organisations, also appoints the remaining members.

The 2000 research and development budget on a total cost basis is £25.77m (€32.7m), of which £18.35m (€23.3m) relates to research in sustainable agriculture and rural development and £7.43m (€9.4m) to food research. The R&D programmes in 2000 are funded as follows:

State Grant	£14.483m	€18.4m
Community Support Framework	£3.457m	€4.4m
Industry	£4.923m	€6.3m
EU Framework contract income	£0.870m	€1.1m
Other income	£2.037m	€2.6m

Teagasc also undertakes an extensive farm advisory service, with a total current budget of £24.205m (€30.7m) in 2000. It has other activities relating to education and training, but in accordance with international definitions of science and technology, these are not included in the science budget.

A New Focus for Teagasc Services

Following a major review of its services in 1998, Teagasc launched a new strategy –*Teagasc 2000*- for the period 2000-2005. The new focus for research, advisory and training services reflects the central role which the organisation must play in supporting the agri-food industry to become an innovative, high-productivity, high-quality and high-skilled sector which can successfully compete in the more global market.

The new strategy involves a substantial re-orientation of research services towards the critical areas of food innovation, safety and quality. Increased priority is also being devoted to research on competitive and sustainable grass-based milk and meat production. In addition, new research initiatives are being undertaken in economic and policy analysis and in rural development. With the aid of significant new funding, the organisation will also embark in 2000 on a greatly expanded programme of agri-food biotechnology.

7.1 New Strategy Highlights

- Increased resources are being allocated to food processing and related technology transfer services, with particular emphasis on food safety, underpinning new consumer product development, ensuring more consistent quality in beef and supporting SMEs.
- Livestock and crops research will be concentrated on enhancing Ireland's competitive advantage through lowest cost production systems and increased consistency and quality of products.
- The Environment Programme is being strengthened in order to provide the necessary information which will facilitate the environmental sustainability of Irish agriculture, including the quantification of the economic costs of achieving optimal environmental and soil fertility responses.
- Policy analysis research and the organisation's capabilities in projecting the outcomes of policy changes is being expanded, in particular through the development of an econometric model of the agri-food sector.
- The Rural Development Programme is being focused on modelling rural area change, identifying new opportunities for employment and wealth creation and analysing factors underlying new enterprise viability, including market opportunities;
- There will be an enhancement of the organisation's capabilities in the area of biotechnology/genetic engineering in food and animal and crop production programmes.

R&D Programme

The Research and Development programme comprises the following elements:

- Research in Sustainable Agriculture and Rural Development
- Research in Food Processing

£'000	
1999	2000
17,958 (€22,802)	18,872 (€23,963)

Research in Sustainable Agriculture and Rural Development

The research programme in Sustainable Agriculture and Rural Development, comprising 191 projects in 2000, aims to maximise farm incomes and employment in rural areas by:

- developing livestock and crop production systems designed to reduce production costs and raise product quality, and doing so in a manner compatible with environmental and animal welfare requirements;
- projecting the impact of policy developments and changes in the economic performance of farm enterprises and consumer markets on the competitiveness of the agri-food industry
- providing the strategic knowledge base to support the continued viability of rural areas
- quantifying the environmental response of various agricultural systems and making available to farmers the information required to ensure environmental sustainability.

The European Union, in Agenda 2000, stresses the importance of improving the competitiveness of the broader European agriculture and agri-food sectors in the context of trade liberalisation and an expected growth in world food demand. Enhancing competitiveness, however, is no longer simply a matter of raising production efficiencies, increasing yields or breaking into new markets.

Changes on world markets are impacting on Irish agriculture as never before, with increased consumer demands for food which is safe, is produced in an environmentally sustainable

manner and with respect for animal welfare. Teagasc's agricultural research programme is increasingly concerned with these consumer-related dimensions of agricultural production.

Research will involve

- Developing strategies for grass production, seasonal growth, quality and utilisation, including assessing grass and clover varieties under grazing conditions
- Developing nutritional and management regimes to improve the quality and safety of milk, beef, sheep and pig meats to enhance their market value
- Assessing the suitability of different dairy, beef and sheep breeds in grass-based production systems and developing new technologies to improve the efficiency and quality of animal production
- Developing management strategies to promote positive herd health and welfare status, so as to efficiently produce safe and quality food
- Improving tillage and horticultural crop production, with particular regard to increasing production efficiencies while improving product quality and safety and minimising environmental impacts
- Developing improved systems for the production and management of farm forestry and organic produce.

Research on biotechnology in relation to crops and livestock will focus on:

- Securing the development of Irish agriculture while protecting the environment represents a significant national challenge. The goal is to develop farming systems that allow farmers to optimise production efficiencies while minimising the impact on the environment.

Research will involve:

- Quantifying the environmental implications of a range of farming systems leading to the development of production practices which will achieve the required environmental targets, with particular regard to quantifying the relationship between soil and fertiliser nutrients and grassland and crop responses
- Modelling the environmental risk of agricultural production systems and practices in different geographical locations
- Quantifying emissions from farming systems including pig, poultry and mushroom enterprises, and identifying strategies to reduce them.

Ireland's agriculture and food industry faces a difficult period of adjustment after the year 2000 when EU policy changes are expected to move towards greater trade liberalisation. To meet these challenges, there will be a critical need for research and analysis on the impact of policy changes on the agri-food sector and rural areas. The proposed research will aim to strengthen policy formation, provide the strategic knowledge base which will support the continued viability of rural areas and, through strengthening its information management resources, enable Teagasc to become an established source of high quality information in relation to all aspects of the agri-food sector and rural development.

Research will involve:

- Further development of quantitative sectoral models for use in projecting the impact of changes arising from further policy reforms, in particular CAP and liberalisation of trade under the WTO
- International benchmarking of the relative competitive strengths and weaknesses of farm enterprises and the food processing sector, including comparisons of the adaptability of the industry to changing market demands
- Modelling the dynamics of change and assessing the impact of policy and other factors on rural areas
- Establishing the implications of employment changes and the expected increase in part-time farming for household viability and replacement/succession of farms
- Identifying factors which influence the establishment and viability of alternative employment opportunities and enterprises
- Conducting socio-economic studies of the contribution of farm forestry to farm income and rural development
- Developing information systems to support the strategic development of the rural economy
- Monitoring changes in the economic performance of the main farm enterprises, including assessment of the investment capacity of different types of farms
- Developing models of consumer preferences to predict future demand in consumer markets for Irish food products and to guide product development and innovation
- Assessing the implications for the agri-food sector of structural changes in food production, processing and retailing.

	£'000	
	1999	2000
	6,983	7,599
	(€8,867)	(€9,649)

Food Processing

The research programme in Food Processing, comprising 62 projects in 2000, aims to:

- ensure that the highest standards in terms of quality, safety and nutrition are consistently achieved in manufactured food products;
- overcome product development problems associated with the seasonal variations in raw material composition; and
- provide the necessary scientific and technological enabling capacity in food products and ingredients.

The priorities for the food research programme in 2000 and beyond are as follows:

Food Safety: To develop preventative measures to ensure the microbiological and chemical safety of Irish food

Cheese and Fermented Dairy Products: To improve the flavour, texture, functionality and yield of cheeses and fermented dairy products as a support for competitiveness in product development and differentiation.

Food Ingredients: To elucidate the compositional and processing determinants of the functionality of food ingredients and develop technologies which improve the functional and nutritional attributes of ingredients and enhance expertise in their use in formulated foods.

Beef, Lamb and Pig Meats: To develop technologies, including packaging systems, for the efficient production of fresh meat products of consistent quality, and convenience meat products that are both wholesome and nutritious.

Prepared Consumer Foods: To elucidate the major factors which determine the quality of prepared food products and to evaluate processes and functional ingredients for the improvement of existing products and to facilitate the development of new products.

Food Nutrition/Functional Foods: To investigate new technologies for the nutritional enhancement of food products and to support product development and marketing strategies that respond to nutritional trends.

Competitiveness: To identify longer term changes in consumer attitudes and project market trends, with particular regard to the analysis of developments in the consumer products and the food ingredients markets.

The enhanced programme of research in food biotechnology will involve:

- Developing improved food cultures and their metabolites to enhance the quality and safety of food products
- Using molecular separation processes and fermentation for conversion of indigenous biological raw materials into value-added products
- Developing novel enzymes to improve flavour and texture of foods and for the production of nutritional and functional food ingredients

Technical Services in Sustainable Agriculture and Food Processing

£'000	
1999	2000
2,900	3,054
(€3,682)	(€3,878)

The objective of this programme is to provide a range of services that facilitate, promote and service the requirements of the agri-food industries. The specific objective of providing technical service to the food industry is to raise the innovative impact of the industry and support the development of small and medium scale food enterprises.

The provision of services is based on the premise that these are areas where Teagasc research is in a unique position to provide information necessary for the development of the agri-food industries.

In agriculture, services are provided in the following areas:

- analytical/diagnostic services such as the nematology service to the Department of Agriculture, Food and Rural Development; analysis of silage, meals, water, compost, soils and plants; diagnosis of animal and other diseases;
- consultancy services to Irish and EU agencies in areas such as land resource management, equipment development and Leader Programmes;
- the National Farm Survey.

Based on the strategic research capability outlined already, and associated expertise in product and process innovation, Teagasc provides Technology Development Services for food companies, and especially for small and medium scale enterprises, in the following areas:

	£'000	
	1999	2000

- consultancy and contract research in product development and product/process improvement;
- pilot plant facilities for R&D and small-scale manufacturing;
- assistance with registration for ISO 9000 and installation of quality management schemes;
- assistance with market investigations, market trends and analysis of market opportunities for food;

Advice and Development Services

27,828	28,857
(€35,334)	(€36,640)

Teagasc provides professional advice to farmer clients at enterprise level dealing with dairying, cattle, tillage crops, horticulture, financial management, agri-tourism, farm modernization, environmental conservation/control of farm pollution, winter feed quality and overall farm management.

Programme support includes the provision of specialist training to advisers to enable them to keep abreast of S&T developments. Through its nation-wide network of over 100 offices and 230 advisers, Teagasc maintains contact with 90,000 Irish farmers. It provides advisory services under contract to 30,000 of the more progressive of these farmers.

In the course of a typical year, Teagasc advisers make 75,000 farm visits, provide 225,000 other consultations and supply information to 100,000 attendees at demonstrations and meetings.

Expenditure on the service in 2000 was £23.549m (€29.9m), of which £6.150m (€7.8m) was received from the Community Support Framework; the estimate for 2000 is £0.279m (€0.4m). Fee income of £8.085m (€10.3m) was earned in 1999 with £9.911m (€12.6m) expected in 2000.

Department of Arts, Heritage, Gaeltacht and the Islands

The Department of Arts, Heritage, Gaeltacht and the Islands was established in 1997. It is responsible for

- the formulation of national policy relating to Arts and Culture - An Chomhairle Ealaíon/the Arts Council comes under its aegis;
- the promotion of the cultural, social and economic welfare of the Gaeltacht (Irish-speaking areas principally along the western seaboard) and the preservation and extension of the use of Irish as a vernacular language;
- the National Museum of Ireland, the National Library of Ireland, the National Gallery of Ireland, the National Archives, the National Concert Hall, the National Heritage Council and the Irish Museum of Modern Art;
- the formulation of national policy relating to broadcasting and the audio-visual industry; and;
- the formulation and implementation of national policy in relation to Heritage, including Inland Waterways, National Parks and Wildlife which were formally the responsibility of the Office of Public Works, as well as National Monuments and Historic Properties.
- Promoting the sustainable development of the populated offshore islands.

Islands Division

£'000	
1999	2000
105	170
(€133)	(€216)

The Islands Division provided grant aid to local authorities and to Udaras na Gaeltachta to carry out a number of specialist studies in 1999. These included hydrographical surveys for a new pier on Clare Island, Co. Mayo and improved pier facilities at Machaire Rabhartaigh, Co. Donegal. Also included were feasibility studies for airstrips on the offshore islands and the appointment of consultants to evaluate and make recommendations on the case made for the provision of a cablecar serving Inis Bigil, Co. Mayo.

In 2000, the Islands Division intend to grant aid to Mayo County Council for the cost of carrying out a feasibility study for a new pier on Clare Island and continue to reimburse Udaras na Gaeltachta for the cost of conducting feasibility studies for airstrips on the offshore islands.

In addition to this, the Division will pay 50% of the cost of carrying out an Environmental Impact Assessment of the potential impact of the construction of an airstrip in Clifden, Co. Galway to serve the islands off the Co. Galway coast.

	£'000	
	1999	2000
National Parks and Wildlife Service	787	980
	(€999)	(€1,244)

The Research Branch provides the necessary scientific expertise and advice for the implementation of Ireland's nature conservation policies including those arising under the Wildlife Act, 1976 and various EU Directives and Regulations relating to nature conservation.

Designations and Inventory

Surveys are required to assess the conservation value of habitats and species and to delimit the boundaries of sites of conservation importance, notably proposed candidate Special Areas of Conservation (pcSACs) and proposed Natural Heritage Areas (pNHAs). During 1999 particular emphasis was placed on sites containing populations of species that are listed on Annex II of the E.U. Habitats Directive, notably Freshwater Crayfish *(Austropotamobius pallipes)* and Freshwater Pearl Mussel *(Margaritifera margaritzfera)*. Boundaries of pSACs were reviewed in response to recommendations from Management and Research Branch, and as a result of appeals from the general public.

During 1999 a national survey was undertaken of the status and distribution of Petalwort *(Petalophyllum ralfsii),* a species that is listed under Annex II of the Habitats Directive. The results indicate that this species, formerly thought to be confined to sand dune slacks, also occurs on machair systems and that Ireland holds the largest known populations in the world. Research staff contributed to papers in peer-reviewed journals, most notably on the discovery of a living population of the moss, *Paludella squarrosa,* a species only known previously in Ireland as a fossil. Preparatory work towards a Red Data Book for Irish bryophytes commenced and identified eighteen species for inclusion in the Flora (Protection) Order, 1999.

Management Planning

This involves the production, auditing and updating of management plans for all Dúchas owned properties (National Parks, nature reserves etc) and conservation plans for all designated lands (Special Protection Areas, Special Areas of Conservation etc).

Wetlands

Vegetation Study of Upland Grazing Exclosures

A botanical survey and vegetation condition assessment was initiated in fenced plots or exclosures that were established, on NPW lands within NIA/SACs and National Parks in counties Kerry, Galway, Mayo, Donegal and Wicklow, in order to assess the recovery potential of overgrazed or eroded upland habitats consequent on the exclusions of grazing animals. The data recorded will provide a detailed baseline against which future changes in vegetation type and cover in and around these plots can be assessed. Both detailed and rapid methodologies have been developed, the former yielding more species information requiring an experienced botanist, non-specialist personnel can carry out the latter focussing on more structural features.

Action Plan for Blanket Bogs

A review of the current state of knowledge of blanket bog, raised bog and turlough resources in Ireland was initiated in 1999. The review will elucidate the means by which deficits in knowledge can be re-dressed with the aim of advancing the conservation of these priority habitats. Collation of the regional blanket bog botanical reports into a national report began in 1999 and will be completed in October 2000.

Raised Bog Survey

A survey of 20 raised bog NHAs commenced with the objective of identifying further suitable sites for designation as SACs within the 'active' or 'degraded' raised bog categories.

Raised Bog Restoration Program

The EU Cohesion-funded Raised Bog Restoration Program was completed with approximately 2501cm of drains blocked on 8 SACs and 1.3 km of larger drains blocked at Raheenmore Bog. Design procedures developed in Ireland during the Restoration Program are also being used in raised bog restoration works in The Netherlands

Bird Research

Monitoring wintering populations of migratory geese

Together with BirdWatch Ireland, Research and Wildlife Management staff carried out censuses of the four species of migratory geese, which spend the winter months in Ireland -- Greenland White-fronted Geese, Greylag Geese, Barnacle Geese and Pale-bellied Brent Geese. The populations of all four species were found to be in a healthy state. The Irish Army Air Corps kindly provided aircraft and pilots for the Barnacle Goose census as a large proportion of the population inhabits inaccessible offshore islands.

Waterfowl monitoring

In addition to the above-mentioned goose censuses, the general survey and census of migratory waterfowl (ducks, geese, swans, waders, etc.), known as I-WeBS — the Irish Wetland Bird Survey, continued in 1999. This involves monthly (September to March) censusing of all waterfowl species at many hundreds of wetlands throughout the country, with priority given to wetlands of international importance and especially Special Protection Areas. The project is a joint one with BirdWatch Ireland and the Wildfowl & Wetlands Trust (UK). The data collected are summarised in a published annual report, which is an invaluable aid to conservation of important wetland sites. The fieldwork is carried out by Bird Research Section and Wildlife Management staff and a large number of BirdWatch Ireland volunteers.

Terns and other breeding seabirds

The on-going programme of tern conservation, monitoring and research continued in 1999 at Rockabill, Dublin Port, Dalkey Island (Co. Dublin), Kilcoole/Newcastle (Co. Wicklow) and Lady's Island Lake (Co. Wexford). This programme is a joint one with BirdWatch Ireland and aims to ensure the favourable conservation status of the five breeding tern species in Ireland. 1999 was an exceptionally good year for breeding success at all the colonies. The work on Roseate Terns was co-funded by the EU INTERREG programme.

1999 saw the launch of "Seabird 2000", a new three-year survey and census of all breeding seabirds in Ireland and Britain, to establish population trends since the last complete surveys were carried out in the mid-1980s and 1969/70. Dúchas Research and Management staff together with BirdWatch Ireland staff and volunteers concentrated in the first year on covering the most important breeding colonies in terms of numbers and species diversity. Significant progress was made in 1999 and it is expected that the project will be completed in 2001.

Breeding Hen Harrier survey 1998-1999

The Hen Harrier is a Red Data Book species and an Annex I species under the Birds Directive. In partnership with BirdWatch Ireland and the Irish Raptor Study Group NPW organised a breeding survey in 1998 & 1999 to provide a baseline assessment of the species' status and distribution. The core breeding range, mainly in the south Midlands and south-west of the country, was almost completely surveyed. In counties Galway to Donegal, randomly-selected 10km squares were surveyed. A total of 78 confirmed pairs were located, with a further 15 probable or possible pairs. The best hill ranges contained 4-6 pairs of Hen Harriers/10km square, and also showed a high rate of breeding success. The survey results are being prepared for publication

Monitoring

The Birds and Habitats Directives in addition to providing for the designation of important conservation sites also impose clear obligations in relation to monitoring of such sites. The surveys undertaken on a species level (such as those undertaken in the context of the Bird Research Programme) or those undertaken in relation to individual sites (survey data from SAC's, SPA's etc.) form an integral part of the monitoring obligations. In addition to these surveys a programme for gathering national statistics on the physical integrity of designated sites was piloted during 1999 with encouraging results. While further work on this programme is required the procedures for compiling these statistics are under development and further progress is expected in 2000. A pilot remote sensing programme to investigate the detection of damage to sites from the interpretation of satellite imagery was completed during 1999. The results are currently being evaluated with a view to possibly refining this process during 2000.

Coastal Ecology and Rare Species

A Survey of protected and threatened flora of Co. Mayo was completed which was a continuation of work carried out in other counties since 1990. Shingle, or coastal gravel, is an annexed habitat under the EU Habitats Directive. It is threatened by coastal development, recreational pressure and gravel extraction. A comprehensive inventory of the coast of this jurisdiction was carried out along similar lines to previous inventories of sand dunes and salt marshes, which facilitated identification of sites of high conservation importance. A detailed survey of all golf courses presently occurring in candidate SACs was carried out with a view to the exclusion of the more heavily modified areas.

Work continued on the computerisation of biological records, most notably butterflies and bryophytes (mosses and liverworts). Relevés are structured plant species lists, which allow the identification of plant communities and habitats. Work continued on the cataloguing of relevés in Dúchas archives and also those located in Teagasc which relate to a major national grassland survey. It is envisaged that this work will conclude in 2000.

Restoration Ecology

Work on the Annestown Project (Co. Waterford) continued with the creation of new aquatic habitats integrated into the existing farming pattern of the locality. Grazing trials in Killarney in which the impact of Kerry Cattle on wildlife habitats is being assessed, continued. Cattle grazing by hardy breeds may have a role in habitat management in the future.

Woodlands

The collation of data on the area of woodlands in NHAs and SACs was completed in 1999. Over 30,000ha of woodland occurs in NHAs and SACs. The counties with the most woodland are Wicklow, Kerry and Clare and those with the least are Monaghan, Cavan and Dublin. Work also continued on the People's Millennium Forests Project, which is sponsored by Allied Irish Banks plc, the National Millennium Committee, the Forest Service and Coillte in association with the Woodlands of Ireland Group, Dúchas - the Heritage Service and the Heritage Council. 16 sites were selected throughout the country (including two in Northern Ireland) covering an area of approx. 570 hectares. These sites are to be planted with native tree species in the largest woodland restoration programme undertaken in Ireland.

Invertebrates and Marine

Freshwater issues primarily addressed the maintenance of species requiring protection under the provisions of the EU Habitats Directive. Work continued on developing a simple methodology for re-establishment of the white clawed crayfish, Austropotamobius pallipes, from which it recently disappeared in Ireland while work on the freshwater mussel, Margaritifera margaritifera, focused on the development of a standard technique for locating young mussels in river gravels. In the case of both the crayfish and mussel, Ireland now holds an appreciable proportion of the entire EU population of the species and work on the selection of suitable sites as SAC's for the protection of both species continued.

On the terrestrial front, the conservation needs of three species of vertigo snails which are listed in the Habitats Directive received considerable attention in 1999. Each of these species require specialist knowledge and techniques for both survey and correct identification. Vertigo species are currently cited as part of the basis for selection of 22 proposed SAC's. On the marine side, the year was dominated by the need to refine and operate procedures for the selection of Special Areas of Conservation (SAC's) for the protection of marine habitats and organisms. 33 marine SAC's have now been proposed for designation.

Technical Information

	£'000	
	1999	2000
Wildlife Service:	759	540
	(€964)	(€686)

While the main duties of wildlife personnel throughout the country involve the management of nature reserves and the enforcement of regulatory provisions of the Wildlife Act, they also provide an advisory service to the Government and the public. The service undertakes general advisory activities and talks in schools and other educational centres. Scientific papers are produced regularly on a wide range of topics.

Údarás na Gaeltachta

Údarás na Gaeltachta was established under the Údarás na Gaeltachta Act, 1979 and came into operation on 1st January 1980. It operates under the aegis of the Minister for Arts, Heritage, Gaeltacht and the Islands (Aire Ealaíon, Oidhreachta, Gaeltachta agus Oileán).

The objectives of An t-Údarás are as follows: to encourage the preservation and extension of the Irish language in the Gaeltacht; to attract suitable native and foreign manufacturing projects to the Gaeltacht; to establish, develop and manage productive employment enterprises in the Gaeltacht; to participate in industries as an equity partner; and to provide services to assist new industries becoming established.

Údarás na Gaeltachta is financed by a grant-in-aid, rents, the European Social Fund, repayable advances and other income.

Údarás na Gaeltachta employs 118 people.

Research and Development

	£'000	
	1999	2000
Research and Development Grants:		
Grants of up to 60% subject to a maximum of £100,000 (€126,973) for any one project are available to assist R&D in industry in the Gaeltacht regions. Since 1995 this programme is funded from Measure 1, Retex, and other areas of the Operational Programme for Industrial Development on a re-imbursement basis from Enterprise Ireland. £766,000 (€972,820) was re-imbursed in 1999 and £800,000 (€1,016,000) is expected in 2000.	1,972 (€2,504)	1,900 (€2,413)
61 grants were awarded in 1999, of which 53 went to manufacturing industry and 8 went to the marine sector.		
Two people are employed on this programme.		
Feasibility Study Grants:		
These grants enable individuals, groups and firms to seek out and evaluate prospective new product ventures.	146 (€185)	150 (€190)
51 grants were given in 1999.		

Natural History Museum

[This text has been prepared by Forfás in the absence of information from Natural History Museum]

The Natural History Museum originated as one of the many activities initiated by the Royal Dublin Society in furtherance of its aims of fostering the useful arts and science in Ireland. The nucleus of the museum was formed by the purchase in 1792 of the Leskean collection of minerals and insects aided by a grant from Parliament. Under the Dublin Science and Art Museum Act, 1877, responsibility for the Museum was undertaken by the State. In 1924, the Department of Education took responsibility for the Museum and in 1982 it was transferred to the Department of the Taoiseach. In 1993 its functions were transferred to the new Department of Arts, Culture and the Gaeltacht.

The functions of the Museum include: the provision of public exhibitions, the dissemination of information to the public on zoological, entomological and geological material, and the curation thereof.

Programme funding for the Natural History Museum is a non-fixed proportion of the budget for the National Museum of Ireland, which is received from the Department of Arts, Culture and the Gaeltacht.

The museum employs 4 permanent, 1 contract professional and technical staff. The museum also shares the services of artists and crafts persons on a part-time basis from the National Museum departments.

Its activities are as follows: the classification, cataloguing, presentation, restoration and display of zoological, geological and entomological material of Irish and foreign interest and provenance. It carries out fieldwork to collect material for research purposes and to fill in known gaps in the collections. Samples for outside organisations and members of the public are identified and lectures and information on relevant matters are provided.

Technical Services

	£'000	
	1999	2000
Zoology and Entomology:	113	113
	(€143)	(€143)

Insects, pests and zoological specimens are identified for among others, Health Board Inspectors, Government Departments and the Dublin Port and Docks Board. A permanent programme of curation appropriate to the differing requirements of the perishable biological specimens in its care is undertaken.

Fieldwork in entomological and marine fauna is carried out with particular emphasis on filling gaps in the collections. Research is carried out on the collections. Worldwide links are maintained with colleges, museums, and State bodies providing scientific information on matters relating to zoology and entomology.

2 zoologists and 1 technical assistant are employed in the zoological/entomological section.

Geology:	57	57
	(€72)	(€72)

Fieldwork is undertaken with a view to adding material to its geological collections and assistance is given to other research workers. Information is provided by way of publications, identifying specimens, answering queries and giving occasional lectures. A permanent display is maintained and exhibitions mounted.

2 geologists are employed in the geological section.

Department of Enterprise, Trade & Employment

The Mission Statement of the Department is:

Promoting employment, enterprise, economic growth, employee welfare and consumer rights.

Strategic Goals:

- To promote the ongoing development of an environment within which enterprise can flourish.
- To foster a fair and effective business regulatory system, which promotes and enforces competition and protects public and consumer interests.
- To promote fairness and efficiency in the labour market thereby maximising employment, protecting the welfare of workers and promoting social inclusion.
- To implement the business goals of the Department within a culture which promotes openness and transparency towards customers, and which emphasises high quality service delivery.
- To further develop staff skills, support structures and systems to assist the Department in implementing a programme of change.

It also has responsibility for certain State-sponsored bodies entrusted with either the implementation or formulation of policy programmes in regard to these functions, viz. the Patents Office, Enterprise Ireland, IDA Ireland, Forfás and Shannon Development. It also subvents the NMAC and the NMRC.

The Department's own activities are financed through a general vote of the Oireachtas and through other income. The Department employs thirteen staff in its S&T activities, mainly in the **Office of Science and Technology** (OST).

The Office of Science and Technology administers, through its S&T Development Programme, the funds available under the Research and Development Programme of the Industry OP. An amount of £66.5 million (€84.4m) has been allocated in 2000 this amount is broken down as follows:

	£'000	
	1999	2000
Measure 1 : Industry RTI Initiative	23,605 (€29,972)	37,061 (€47,058)
Measure 2 : Higher Education/Industry Co-operation Services	12,394 (€15,737)	17,283 (€21,945)
Measure 3 : Human Resources Development	292 (€371)	1,000 (€1,270)
Measure 4 : Research	9,416 (€11,956)	10,317 (€13,100)
Policy and Evaluation	440 (€559)	437 (€555)
Belderrig Research Centre	500 (€635)	378 (€480)

	£'000	
	1999	2000
OST also has ultimate responsibility for the Technology Foresight Fund of over £500m, established to build up a strong strategic research capability in Ireland in Biotechnology and Information and Communications Technologies. £25m was allocated to this activity in 2000, which is being implemented by a new organisation, *Science Foundation Ireland,* within Forfás.		
Advisory Services Administration and advisory services to the Minister on general S&T matters and liaison with, and monitoring of, NMRC activities and related elements of other departments.	336 (€427)	346 (€439)
Policy and Evaluation Under this heading funding is provided to Forfás to undertake various tasks on behalf of the Office of Science and Technology related to the S&T Development Programmes. These include on-going evaluations of the different sub-measures. In addition funding is provided for the Science, Technology and Innovation Awareness Programme and the Annual North-South Innovation Lecture. The Office of Science and Technology provides funding for and is represented on the policy formulation committees of the following international organisations: The European Space Agency (ESA), EUREKA, the European Molecular Biology Conference (EMBC) and Co-operation in Science and Technology (COST). It is also responsible for advising the Minister on general S&T activities and agencies funded by the Department. The Office of Science & Technology co-funded the Technology Foresight Initiative which was undertaken by the Irish Council for Science, Technology and Innovation (ICSTI) on behalf of the Minister. Its aims were to identify emerging technologies that will be key to national development in the medium to longer term and to present a plan outlining the actions that we need to take now to ensure that we are well placed to exploit future opportunities. The results of the Technology Foresight Initiative will assist Ireland's competitiveness particularly in a Post-1999 scenario of EU reduced funding levels, whereby it will be necessary to prioritise spending on those technologies of key economic importance to Ireland in the medium to long-term.	440 (€559)	437 (€555)
International Collaboration National contributions to, and participation in, European Space Agency, European Molecular Biology Conference, Co-operation in Science and Technology Programmes (COST) and EUREKA.		
The main objective of joining the ESA is to stimulate high technology industry in Ireland. The greater part of Ireland's contribution is returned as industrial contracts involving collaboration between enterprises in the Member States.	4,990 (€6,336)	4,990 (€6,336)
The objective of the EMBC involvement is to secure fellowships that enable biologists to work abroad thus widening their experience and links. Ireland receives fellowships, the value of which exceed the membership costs.	40 (€51)	48 (€61)

	£'000	
	1999	2000
The COST programmes are co-operative R&D projects by 19 participating countries in areas that, for financial and technical reasons, would be beyond the scope of any individual country.	2 (€2.5)	2 (€2.5)
*Biennial contribution		
EUREKA, is a European research initiative designed to ensure that the technological gap with other countries is narrowed. It promotes joint research between firms in different countries.	22 (€28)	16 (€20)

Dublin Science Technology and Innovation Centre

The Office of Science and Technology is providing funding for and overseeing the development of a statement building at Citywest Business Park. DSTIC Ltd has been set up to progress the project with the Office of Science and Technology as the Minister's representative on the Board.	200 (€254)	200 (€254)

Belderrig Research Project

Funding has been made available for the construction of a major Research and Study Centre at Belderrig, adjacent to the Céide Fields Visitor Centre, in Co. Mayo. The research facility will be complimentary to the Céide Fields Visitor Centre and will play an important role in ensuring its long-term viability through the creation of new research results, necessary for the continuation of the Céide Fields.	500 (€635)	378 (€480)

Forfás

Forfás was established on 1 January 1994 under the terms of the Industrial Development Act, 1993 and is an autonomous agency under the aegis of the Department of Enterprise, Trade and Employment. It is the policy advisory and co-ordination board for industrial development and science and technology in Ireland. Forfás is the body in which the State's legal powers for industrial promotion and technology development have been vested. It is also the body through which powers are delegated to Enterprise Ireland for the promotion of indigenous industry and to IDA Ireland for the promotion of inward investment. Forfás has responsibility for the activities of the National Accreditation Board, (NAB).

The broad functions of Forfás are:

- to advise the Minister on matters relating to the development of industry in the State;
- to advise on the development and co-ordination of policy for Enterprise Ireland, IDA Ireland, An Bord Trachtála and such other bodies as the Minister may designate;
- to promote science and technology for economic and social development;
- to encourage the establishment and development in the State of industrial undertakings from outside the State; and
- to advise and co-ordinate Enterprise Ireland and IDA Ireland in relation to their functions.

The total grant-in-aid to Forfás in 2000 is £13.4m (€17m) and there is a staff complement of 116.

	£'000	
	1999	2000
S&T Division:	973	1,153
	(€1,235)	(€1,464)

The mission of Forfás in science and technology is to enhance Ireland's performance in science, technology and innovation and thereby contribute to economic and social development.

The general objectives of the S&T Division are:

- To formulate policy advice on the key national and international issues relating to science, technology and innovation (STI) and to convey this advice to Government and in particular to the Department of Enterprise, Trade and Employment.
- To monitor and assess STI performance in Ireland and relevant international trends. This is done by surveying business sector investment in research and innovation; surveying the research performance and capability in the third level sector; monitoring the level of Irish participation in the EU Framework Programmes; evaluating national STI programmes and by carrying out an annual review of State investment in S&T (the Science and Technology Budget).
- To make recommendations for improved co-ordination between the various actors in relation to their STI activities.
- To stimulate a greater appreciation and understanding of the role of STI in economic, industrial and social development.

£'000	
1999	2000

The activities undertaken by the S&T Division cover five main areas:

- Delivering timely and well-founded policy analysis and advice on science, technology and innovation issues to national policy-makers.
- Undertaking evaluations of existing S&T policies and programmes, in order to improve their performance and relevance to economic development.
- Providing data, indicators and a flow of other information on science, technology and innovation to policy-makers, decisions-takers and interested groups in the public and private sectors.
- Providing secretariat and research support for the Irish Council for Science, Technology and Innovation.
- Advising and providing support to the Office of Science and Technology on international science and technology programmes and issues.

The S&T Division has a total staff of 15 people and an expenditure of £973,000 (€1,235,000) in 1999 and a budget of £1,153m (€1,464m) for 2000.

During 1999 major activities undertaken by the S&T Division included:

Science Foundation Ireland:

-	25,000
-	(€31,743)

During 2000 the Government set up *Science Foundation Ireland* to establish Ireland as a centre of research excellence in strategic areas relevant to economic development, particularly Biotechnology and Information and Communications Technologies (ICT). The Technology Foresight Reports, published in 1999 by the Irish Council for Science, Technology and Innovation (ICSTI) and Forfás, had recommended that the Government establish a major fund to develop Ireland as a centre for world class research excellence in strategic niches of Biotechnology and ICT. As part of its response, the Government has approved a Technology Foresight Fund of over £500 million (€635m) for investment in research in the years 2000 – 2006.

Science Foundation Ireland is responsible for the management, allocation, disbursement and evaluation of expenditure of the Technology Foresight Fund. The Foundation has been set up initially as a sub-board of Forfás.

Irish Council for Science Technology and Innovation:

Established in 1997, as a Committee of Forfás, the Council advises the Government on the strategic direction of science, technology and innovation (STI) policy. Its advice encompasses all aspects of STI policy including: primary, secondary and third-level education; scientific research; technology and research, development and innovation in industry; prioritisation of State spending and public awareness of STI issues.

ICSTI has twenty-five members. The Council is chaired by Dr. Edward M. Walsh, President Emeritus, University of Limerick Foundation.

The ICSTI Secretariat is provided by Forfás, the national policy and advisory board for enterprise, trade, science, technology and innovation.

The Council implements its work programme through the establishment of Task Forces to deal with agreed priority topics. On completion of work on one of the priority issues, the next priority from the remaining list is agreed and a project initiated.

In the period under review, the Council made significant progress on four agreed priority areas and commenced work on two new areas. Those on which work was completed are:

- Commercialisation of Research (Task Force chaired by Dr. Alva de Voy, KBC Asset Management Ltd.)
- Modern Biotechnology (chaired by Prof. Emer Colleran, NUI Galway)
- EU Sixth Framework Programme of Research and Technological Development (chaired by Prof. Jim Browne, NUI Galway)
- Public Awareness of Science (chaired by Mr. Colum MacDonnell, formerly of Irish Exporters' Association).

Those areas on which work began are:

- Metrics and Impact (Task Force chaired by Dr. Pat Morgan, NUI Galway)
- Industrial Design and Development (chaired by Mr. Paul Holden, Redacteurs Software Documentation Ltd.)

Science, Technology and Innovation Awareness:

Forfás manages this programme, which is now in its fifth year, on behalf of the Office of Science and Technology. The Programme, which arises out of the 1996 White Paper on STI, is aimed at a number of target audiences including young people and their educators, the general public, the business sector and decision makers in Government.

The principal activities during the year were:

- Science Week Ireland
- National Innovation Awards
- National Journalism Awards
- Primary Science Day
- Survey of public Scientific Developments

In 1999 there was a marked increase in coverage of science, technology and innovation matters in the media, particularly in the print media. To recognise this and to encourage even higher quality coverage in the future, the National Science and Technology Journalism Awards were introduced.

Primary Science Day was held on Friday 12 November 1999. To mark the introduction of science as a subject in the revised primary school curriculum, 500 schools were supplied with teaching materials on the theme of temperature and asked to devote half a day to the teaching of science.

The National Innovation Awards were co-sponsored by PricewaterhouseCoopers and the Irish Times and the Science and Technology Journalism Awards by IBM.

Science Week Ireland took place from 7 to 14 November 1999 and attracted the involvement of very large numbers of young people and their families. In addition to the activities in Dublin, large-scale regional events included the Galway Science Festival and the Limerick Science Fair. Cork and Waterford also were centres of activities.

EU Research Framework Programmes:

The implementation and funding of the European Union's research and technology development (RTD) policy is done through multi-annual Framework Programmes. The Framework Programme enables organisations in Ireland, in partnership with organisations in Europe and beyond, to compete for funding for specific research which the European Community considers important for its industrial competitiveness and quality of life.

Forfás monitors the participation of Irish organisations in Framework Programmes and co-ordinates the National Delegates responsible for the promotion of the programmes in Ireland.

These programmes assist in the development of international linkages and are a significant source of research funds for Irish organisations. Forfás also provides policy advice and technical support to the Minister and Office of Science and Technology in relation to EU RTD policy issues.

The EU's Fifth Framework Programme (FP5), which covers all the research, technology development and demonstration activities to be funded by the European Union until 2002 was launched in 1999. The total budget for FP5 is £11.8 billion (€14.9 billion). The research will concentrate on four main areas: Quality of Life; Energy, Environment and Sustainable Development; User-Friendly Information Society; and Competitive and Sustainable Growth.

Forfás has been working during 1999 with the Department of Enterprise, Trade and Employment on the principles that should guide the preparation of a national position for FP6.

Science and Technology Indicators:

Forfás has responsibility for the collection, compilation, analysis and publication of data relating to all S&T activities in Ireland. The areas surveyed include: business sector research, development and innovation; research and development in third level universities and technological institutes; state investment in science and technology – the annual 'Science and Technology Budget'.

During 1999 the findings from the survey of R&D in the business sector in 1997 were published. The Science and Technology Budget for 1999 was completed. The survey of research in third level colleges in 1998 was also completed during 1999.

Programme Evaluations:

The Science and Technology Evaluation Unit within Forfás, which has evaluated all the major public sector S&T programmes in Ireland since 1991, carried out during 1999 an evaluation of Irish participation in the EU's Fourth Framework Programme. This evaluation examined the operation and impacts in Ireland of this Programme, which ran from 1994 to 1998.

The National Accreditation Board (NAB):

The National Accreditation Board (NAB) is the Irish national body within a European network of accreditation bodies with responsibility for accreditation in accordance with the harmonised EN 45000 series of European standards and the relevant International Organisation for Standardisation (ISO) standards and guides.

	£'000	
	1999	2000
	482	444
	(€612)	(€564)

Through the NAB's membership of multilateral agreements, the Irish Accreditation status is recognised internationally. The main benefits of accreditation is that it plays a key role in guaranteeing the access of Irish products and services to the EU market and greatly reduces technical barriers to international trade.

1. Accreditation of Certification Bodies

The NAB accredits Certification Bodies operating product certification, quality system certification and certification of personnel. It also accredits Certification Bodies for Environmental Management Systems (EMS) certification to the EN ISO 14001 standard.

At the end of 1999 NAB had accredited two certification bodies for Quality Management Certification and two certification bodies for Environmental Management Certification. These bodies have in turn certified more than 1,000 organisations to the ISO 9000 series of standards and 105 organisations to 14001 under NAB accreditation.

2. Eco-Management and Audit Scheme (EMAS)

(i) *Accreditation of Environmental Verifiers.* NAB accredits environmental verifiers who meet the requirements of EMAS, Council Regulation (EEC) No. 1836/93 of 23 June 1993. At the end of 1999, NAB had accredited one environmental verifier.

(ii) *Registration for sites participating in EMAS.* Sites participating in EMAS have been independently audited by EMAS Verifiers and found to comply with the Council Regulation (EEC) No. 1836/93. NAB is the "Competent Body" in Ireland for the registration of sites participating in EMAS. During 1999 one site was registered bringing the total to seven.

3. Accreditation of Attestors and Attestation Bodies

Attestation is the examination of the conditions under which tenders are sought for large contracts offered by the water, energy, transport or telecommunications sectors (utilities). The accreditation criteria are in accordance with the European Standard EN 45503 and NAB regulations. At the end of 1999 one body was accredited to this standard.

4. Accreditation of Inspection Bodies

NAB accredits bodies whose work may include the examination of materials, products, installations, plant, processes, work procedures, or services and the determination of their conformity with requirements and the subsequent reporting of results of these activities. At the end of 1999 NAB also commenced a pilot accreditation scheme in support of the EU Directive on E-Commerce.

5. Good Laboratory Practice

The NAB is the National Monitoring Authority for the inspection and verification of Good Laboratory Practice (GLP) under S.I. No. 4 of 1991 European Communities (GLP) Regulations. GLP Compliance Statements for six facilities were re-confirmed in 1999.

Enterprise Ireland

Enterprise Ireland is the national organisation responsible for delivering science and innovation and technology services directly to Irish companies. These services form a vital part of the national scientific and technological infrastructure, along with other science and technology services in both the private and public sectors. Linking science, technology and innovation investment to relevant areas of Irish companies is the focus of Enterprise Ireland's activities. Certain programmes are designed to enhance the relationship between industry and third level institutions.

Many of Enterprise Ireland's Science and Technology programmes are supported by the European Regional Development Fund and the European Social Fund under the various sub-programmes in the Operational Programme for Industrial Development. In addition, Enterprise Ireland administers many elements of the science and technology sub-programme on behalf of the Office of Science and Technology in the Department of Enterprise, Trade and Employment.

The National Development Plan 2000/06 will set out revised approaches in the field of Research and Development for Enterprise Ireland in the future. In addition, Enterprise Ireland is carrying out a review of many of its activities which could have resulting impacts on many of the activities reported.

The figures below include pro-rated capital and overheads.

Research, Development and Demonstration

	£'000	
	1999	2000
Forest Products:	403	391
	(€512)	(€496.5)
Applied research is carried-out to identify opportunities for Irish timber and to develop new applications and standards. In addition, training and assistance with new product and process development is provided to the Irish timber industry.		
Materials Programme:	1,193	1,180
	(€1,515)	(€1,498)
This programme provides a research and development support service to industry and the public sector covering a wide range of material-related research and development with a significant programme in industrial coatings and ceramics.		
National Electrical Test Centre (NETC):	300	269
	(€381)	(€341.5)
NETC is involved in a number of EU-funded international research projects in advanced telecommunications systems and hardware. It is expected that the products developed from this research will contribute to the continuing upgrading of the Irish telecommunications sector.		

	£'000	
	1999	2000

Programmes in Advanced Technology (PATS)

PATs are designed to utilise the knowledge and expertise within the third level sector in a number of key technologies to contribute to the competitiveness of existing industry, particularly Irish owned, attract new overseas firms to Ireland, and aid the establishment of technology driven start-up companies. A special unit provides administrative support to all the PATs which operate under the auspices of Enterprise Ireland, and assists in planning, managing and monitoring the activities of the PATs.

Under the NDP 2000/06 there will be a new funding approach for the PATs. Details of these changes have not yet been finalised.

BioResearch Ireland:

7,894	6,746
(€10,023)	(€8,566)

BioResearch Ireland provides research facilities and support services for the commercialisation of biotechnology opportunities arising in Irish universities and research institutions. It is a joint venture between Enterprise Ireland and the universities designed to optimise the exploitation of their bio-expertise. There are five centres located at UCD, DCU, TCD, UCC and UCG which employ a total of 205 staff. 331 contracts were undertaken in 1999. Income of £5.348m (€6.8m) was earned in 1999 and £3.6m (€4.6m) is expected in 2000.

Advanced Manufacturing Technology (AMT Ireland):

1,534	1,954
(€1,948)	(€2,481)

AMT Ireland provides a range of cost effective solutions to manufacturing problems, through its expertise in key technology areas, by developing and applying advanced manufacturing technology. Technical resources consist of four commercially based centres attached to UCD, UCC, UCG and UL. They provide a range of expertise, training and consultancy in the following key technology areas: World Class Manufacturing (WCM), Manufacturing Information Systems (MIS), Surface Mount Technology for Electronic Assembly, Automatic Inspection, Automation / Computer Integrated Manufacturing (CIM) and Business Process Improvement. 72 staff are employed. 1,112 contracts were undertaken in 1999. Income of £1.259m (€1.6m) was earned in 1999 and £0.8m is expected in 2000.

Optronics:

1,530	1,384
(€1,943)	(€1,757)

Optronics Ireland provides facilities and support for optoelectronics research in Ireland. In addition, it is responsible for assisting in the development of the optoelectronics sector in Irish industry. The programme has five centres located at TCD, DCU, UCC, NMRC and UCG with staff of 60. 94 contracts were undertaken in 1999. Income of £1.506 (€1.9m) was earned in 1999 and £0.5m (€0.6m) is expected in 2000. The financial figures quoted here relate to Optronics Centres in TCD, DCU, UCD and UCC. NMRC activities are accounted for in that agency's programme description.

	£'000	
	1999	2000
Power Electronics Ireland (PEI):	2,170 (€2,755)	2,678 (€3,400)
PEI provides support and facilities for research and product development in the electronics industry. 80 staff are employed in the seven centres at UCD, DCU, NMRC, UCC, UL and UCG. All these centres were certified by NSAI to ISO 9001. A total of 137 contracts were undertaken last year. Income of £1.321m (€1.7m) was earned in 1999 and £1.2m (€1.5m) is expected in 2000. The financial figures quoted here do not include the PEI Centre at NMRC, which is accounted for in that agency's programme description.		
Teltec Ireland:	1,653 (€2,099)	2,852 (€3,621)
Teltec Ireland provides a range of research and development services to the telecommunications industry sector. 52 staff are employed at the five locations, UCD, DCU, TCD, UCC and UL. 62 projects were undertaken during 1999. Income of £0.636m (€0.8m) was earned in 1999.		
The Software PAT and Teltec are being merged into one programme called Informatics Programme. Income of £0.5m (€0.6m) is expected in 2000 from the new programme.		
Materials Ireland (MI):	2,785 (€3,536)	3,501 (€4,445)
MI provides a range of research and development services in the areas of materials and material technology. Expertise is available in ceramic, polymer, composite, metal and coating technologies. 72 people are employed in TCD, UCD, UL, Athlone and Enterprise Ireland. A total of 1,323 contracts were undertaken in 1999. Income of £1.259m (€1.6m) was earned in 1999 and £1.5m (€1.9m) is expected in 2000.		
Software:	1,964 (€2,494)	
The Software PAT provides a range of research and development services and facilities in the areas of software development. 43 persons are employed in software centres through the country. 75 contracts were undertaken during 1999. Income of £0.8899m (€1.1m) was earned in 1999.		
The Software PAT and Teltec are being merged into one programme called Informatics Programme. Income of £0.5m (€0.6m) is expected in 2000 from the new programme.		
Other PAT Programmes :	469 (€595)	849 (€1,078)
In addition to expenditure on the overall management of the programme, £0.177m (€0.22m) was spent in 1999 and £0.5m (€0.6m) is allocated in 2000 for PAT-related developments.		

	£'000 1999	£'000 2000
Grants to Companies		
Feasibility Studies:	3,104 (€3,941)	3,000 (€3,809)
Studies are grant-aided to enable individuals, groups and firms identify and evaluate prospective new product ventures including licensing arrangements. Grants are subject to a maximum of 50% of eligible expenditure or £15,000 (€19,046) – whichever is the lesser. A key part of the Campus Companies Programme was the provision of financial support in the form of a CORD (Commercialisation of Research and Development) grant. The main purpose of the CORD grant is to enable individuals to assess the commercial viability of a project in a number of different areas. Grants are subject to a maximum of 50% of eligible expenditure or £30,000 (€38,092) - which ever is less. The CORD costs are included under the total for feasibility grants. Shannon Development is re-imbursed for feasibility grants to companies in the Mid-West region. These monies are accounted for in Shannon Development's Programme description.		
Research and Development:	15,572 (€19,772)	27,380 (€34,765)
In the National Development Plan 2000/06, there will be two R&D initiatives to replace those which operated under the last OP. There will be an R and D Capability initiative which will be operated by each of the Agencies on behalf of its own clients. It is also proposed that Enterprise Ireland will manage a Competitive RTI initiative on behalf of the Office of Science and Technology which will be open to clients from all agencies.		
Other Company Support		
Software Development:	1,228 (€1,559)	1,500 (€1,905)
An initiative funded from the Operational Programme for Industrial Development will provide financial support to companies for software development. 50% of the costs are borne by the company and 50% by ERDF. The developer will be licensed to sell the product to other potential users. A revised policy was approved by the EU and the Department in 1997 on methods of increasing the use of these funds. All the funds were approved by September 1998.		
Technology Service Centres Programme:	795 (€1,009)	200 (€254)
This programme supports the establishment of campus based centres throughout Ireland focused on specific technologies which provide a range of technology services to industry on a commercial basis. Areas in which Centres have been established since the start of the programme include manufacturing and management systems, surface and interface analysis, CIM, clean technology, food product development, furniture, heat treatment, industrial control, bio-informatics, knitwear, localisation resources, maintenance, materials, avionics, nautical enterprise, timber, toolmaking, toxicology and visual computing.		
This programme is being phased out.		

	£'000 1999	£'000 2000
RTD Management Development:	298	1,000
The RTD Management Development programme is directed at established companies in Ireland, which show the potential to benefit from assistance and guidance in the implementation of all aspects of the innovation process. Participation in the programme will upgrade the ability of companies to produce practical and implementable strategic technology development plans for their companies.	(€378)	(€1,270)
Grants to Third Level Colleges		
Grants were provided for eligible expenditure to participants in the following schemes.		
Note that expenditure figures marked with an asterisk include the value of grants awarded, which are included in the HEA's programme description.		
Basic Research Grants:	3,301*	3,800*
Supports high quality fundamental research and is open to all full time, permanent researchers in the higher education sector in Ireland in the following areas: - biological, chemical, earth, physical, engineering, mathematical, computing sciences. Funding was provided for 30 new projects and 84 previous projects continued to receive support.	(€4,191)	(€4,825)
Strategic Research Programme:	2,424*	2,400*
Supports research of strategic importance to industry and to augment the activities of existing initiatives such as the PATs. Funding was provided for 81 new projects and 220 previous projects continued to receive funding.	(€3,078)	(€3,047)
Applied Research Grants Scheme (Universities):	1,389*	1,400*
Enhances mutually beneficial co-operation and interaction between industry and universities. 57 new industry sponsored contracts were awarded bringing the total number of contracts receiving support to 125.	(€1,764)	(€1,778)
Applied Research Grants Scheme (ITs & DIT):	849	1,200
Supports small applied research projects in the ITs and DIT in collaboration with industry. Funding was provided for 59 new projects as well as 78 projects from last year.	(€1,078)	(€1,524)
Industry Scholarships (MSc):	180	140
Enhances mutually beneficial co-operation and interaction between industry and the higher education sector. 42 new awards were made in addition to 38 from last year.	(€228)	(€178)
Research Scholarships (PhD):	761	760
Supports graduates to complete a continuous period of research in basic training leading to a PhD qualification. 144 new awards were made and 254 scholars continued to receive support from last year.	(€966)	(€965)

	£'000 1999	£'000 2000
Post-doctoral Awards:	206 (€262)	250 (€317)
The Post-doctoral Awards continued to be funded by OST to support post-doctoral research in 1999 and for 2000.		
National Research Advisory Board (Measure 4 Board):	67 (€85)	67 (€85)
This board was established in mid-1995 with support from OST to consider applications under the grant schemes to support research.		

Scientific and Technical Services

Technology Audit Programme:	121 (€154)	
The Technology Audit Programme is now part of the Business Development Directorate but it is reported on as a separate activity. It assesses the current status of technology employed in companies in relation to products, human and material resources. A list of recommendations is given in a Technology Audit report. The objective is to generate change which will improve overall operating efficiency and increase profitability. 14 audits were carried out in 1999. This programme has been phased out and the activities incorporated with the revised approach of Enterprise Ireland.		
Retex:	477 (€606)	872 (€1,107)
The RETEX Operational Programme for Ireland was formally adopted by the Commission on 18 June 1993. The Programme provides an allocation of EU funds of £9.1m (€11.55m) over a five year period. The Programme is concerned with promoting diversification and adaptation in areas with a high dependence on the textile and clothing sector. However, the Initiative is pan-regional in scope and support is not confined to the textile and clothing sector. The closing date for the programme was extended to the end of 1998 to ensure that all funds are drawn down. The RETEX Initiative is implemented by Enterprise Ireland together with IDA Ireland, Shannon Development and Údarás na Gaeltachta on behalf of the Department of Enterprise, Trade and Employment.		
This programme is virtually closed as there are only minor payments still outstanding.		
Energy:	600 (€762)	670 (€851)
The Irish Energy Centre's mission is the promotion of a sustainable national energy economy. The programme of work is designed to stimulate greater energy efficiency and the wider exploitation of renewable energy resources across all sectors of the economy. The strategy employed is designed to generate long term behavioural change, achieved through a processes of implementing, informing, encouraging, supporting and assessing.		
Best Practice Programme - A set of services aimed at promoting the use of best energy management practices in the industrial, commercial and public sector. The measures engaged include the Self Audit programme targeted at industrial high energy users, the boiler initiative targeted at industrial and commercial organisations and the Public Sector Programme aimed primarily at State Buildings.		

	£'000 1999	£'000 2000
The introduction and wider adoption of new and innovative technologies is encouraged by promoting participation in EU energy related programmes such as ENERGIE and the Fifth Framework Programme. In addition to funds received from the Department of Public Enterprise towards its running costs, the Irish Energy Centre also administers grants for energy efficiency and support. Funds available under the Energy Efficiency Investment Support schemes are fully committed and the Scheme is closed for new applications.		
Materials Programme: This programme covers a wide range of materials related services with a significant programme in industrial coatings including a technical support service to industry and the public sector in the areas of coatings technology, metals technology, corrosion technology and non-destructive testing in accordance with national and international standards. Construction-related services are also included.	2,877 (€3,653)	2,846 (€3,614)
National Electronics Test Centre (NETC): NETC provides manufacturers of electrical, electronic and telecommunications equipment with conformance and test services to International and European mandatory standards. Such standards are required by manufacturers to sell their products in Europe. It co-operates with other European partners on the development of conformance testing services for telecommunications equipment as well as working as a partner on the EU funded development projects. 257 jobs were completed in 1999.	811 (€1,030)	727 (€923)
Environment Programme: The primary function of this programme is to assist industry through the planning and licensing systems and in identifying and solving problems in the area of pollution. Environmental Impact Studies are carried out for most large industrial projects. Environmental Audits and Environmental Management systems are an increasing component of the work load last year. The activities included the following: consultancy and analytical services for effluent treatment and disposal, waste disposal and water, technical advice and consulting services to Irish industry in all aspects of air pollution, acoustics and occupational health and safety, independent accredited analysis, technical advice and expert consultancy services on a wide range of trace organic and inorganic pollutants in environmental assessment and planning.	2,391 (€3,036)	2,163 (€2,746)
Forest Products: Technical advice, consultancy services, training and assistance with new product and process development was provided to the Irish timber industry to identify opportunities for Irish timber and develop new applications and standards. In addition, EU and international developments and standards are monitored. A quality assurance scheme is operated on behalf of the Timber Quality Bureau of Ireland.	739 (€940)	696 (€885)

	£'000	
	1999	2000
National Metrology Laboratory:	1,073 (€1,362)	

The National Metrology Laboratory is responsible for maintaining and developing the Irish national measurement standards and disseminates these standards by means of a calibration service. It provides technical advice, consultancy services and training to industrial clients in all aspects of measurement science and technology. In addition, it provides calibration and test facilities for the National Accreditation Board (Forfás). It represents Ireland internationally on metrology matters (EUROMET, OIML, EAL).

During 1999, over 3,200 calibration certificates were issued for over 550 industrial users. There was renewed emphasis on the development of new measurement fields and methods such as mass metrology, low pressure calibration, volume calibration and temperature fixed point calibration.

International Activities:	761 (€966)	851 (€1,081)

Enterprise Ireland co-ordinates, represents and/or administers Ireland's participation in a wide range of international agencies and programmes:

- European Science Foundation which brings Irish scientists together with their counterparts in Europe to work on topics of common concern and enables Irish scientists to participate in key areas of scientific endeavour
- Ireland - France exchange programme develops and intensifies scientific co-operation in designated fields of science and engineering by funding short visits in conjunction with CNRS in France
- A similar bilateral programme exists between Ireland and the UK
- The Science and Technology programme for the International Fund for Ireland
- Ireland's involvement in the European Space Agency, COST and EUREKA programmes

European Space Agency (ESA) - provides for and promotes (for exclusively peaceful purposes) co-operation among European states in space research, technology and space applications with a view to their use for scientific purposes and for operational space application systems in telecommunications, launchers, earth observation and micro gravity.

COST, comprising of 28 member states, promotes basic and applied research between Research organisations on a European wide basis.

EUREKA, comprising 27 members states, promotes close to market R and D between companies on a European wide basis.

- EU Fifth Framework Programme for Research and Technological Development (1999 - 2002) has commenced.

Information and Specialist Advisory Services

All programmes from time to time provide information and advice on technical matters to clients upon request.

	£'000 1999	£'000 2000
Information Programme/Enterprise Link:	1,246 (€1,582)	1,013 (€1,286)

The Information Services Programme provides technical information and literature to companies / individuals seeking technical assistance which can include:

- library information services
- on-line help desk service
- on-line literature searches with access to international databases;
- material lending / photocopying services;
- a telephone help line (information desk);
- the enterprise telephone link.

Information services are also available through the other technical programmes of Enterprise Ireland as follows.

Materials:	41 (€52)	41 (€52)

Information is provided to companies on a range of materials and construction-related issues.

Irish Energy Centre - Information Promotion Programme:	2,482 (€3,151)	3,910 (€4,965)

The promotion of energy saving methods is a continuous priority. The Irish Energy Centre manages a number of information activities aimed at awareness raising. This includes publishing industrial energy good practice guides and case studies for industry as well as booklets on home energy efficiency and renewable energy.

Schools are targeted using energy related teaching materials, which are developed by the Centre. Consumer programmes are designed to promote energy efficiency in the home and while travelling. These include Energy Awareness Week, together with promotion and compliance policing of EU energy labelling legislation for domestic appliances.

The Centre organised and participated in exhibitions, conferences, seminars and workshops throughout the year promoting the efficient use of energy in a range of sectors. It also manages an OPET information office (Organisation for the Promotion of Energy Technology) which is funded by the European Commission.

Environment:	24 (€29)	44 (€54)

Lectures, seminars and workshops are organised to transfer technology to businesses. S&T papers are produced on regular basis during the year.

Forest Products:	73 (€93)	69 (€88)

Information services are given to the construction industry particularly with regard to the use of timber products.

Technology Transfer

	£'000 1999	£'000 2000
Technology Transfer:	1,485 (€1,886)	1,800 (€2,286)

Enterprise Ireland manages a programme designed to promote the transfer of new technical methods and ideas to industry mainly from abroad. Particular emphasis is placed on introducing new products and processes via licensing from abroad. There are currently 19 Technology Transfer executives.

The following services are available:

- Licensing technology – assisting companies to source, evaluate and commercialise a technology. 45 agreements were completed in 1999.
- Intellectual Property - assisting companies to evaluate, value and commercialise inventions. Funding for the patent programmes comes directly from industry.
- Industrial Education Programme – courses and seminars are provided for industry on a wide range of topics in advanced technical subjects.
- Publications - a range of technical publications/papers of which the most important is the monthly magazines "Technology Ireland".
- Advice is given to people seeking information on the commercialisation and patenting of inventions.

Promotion of Technology Transfer from Colleges:	488 (€620)	209 (€265)

In addition to managing grant schemes in the third level sector, other activities in support of Science and Innovation development within Enterprise Ireland include a campus companies programme, which operates in the third level and business sectors, to help the establishment and growth of campus enterprises based on the results of research and development work in the colleges. It also facilitates the licensing of research results from the third level sector to industry.

The Training and Mobility of Researchers Programme is a European programme which is aimed at increasing the quality and quantity of human resources available in Europe for research and technological development.

It provides funding for a number of activities which seek to break down the barriers inhibiting the free and effective movement of skilled researchers in Europe. There are four activities under this programme- Research Networks, Large Scale Facilities, Accompanying Measures and Training Grants.

Technology Acquisition:	140 (€178)	300 (€381)

This programme assists firms to acquire new product or process technologies. Grants are approved up to a maximum of £250,000 (€317,434) or 50% of eligible expenditure.

Techstart / Techman Programmes:	1,909 (€2,424)	1,750 (€2,222)

These programmes are designed to help companies improve their use of technology by placing a young technical graduate or an experienced technologist in a company to improve a company's overall effectiveness. Funding is provided to the company towards meeting the employee's cost in the first year. Techstart placed 193 new graduates during 1999. 21 new Placements were made under the Techman programme in 1999.

Enterprise Ireland jointly manages, with the IPC, a technical graduate placement programme for information technology and systems graduates.

IDA Ireland

IDA Ireland has national responsibility for securing new investment from overseas in manufacturing and international services and for encouraging existing foreign enterprises to expand their businesses. (The attraction of overseas investment to the Shannon Free Zone and the Gaeltacht areas are the responsibility of Shannon Development and Údarás na Gaeltachta respectively).

As part of its brief to develop overseas companies already in Ireland in particular, IDA Ireland focuses on encouraging these companies to locate additional strategic functions in Ireland, such as product and process development and marketing.

With a staff of c.280 people and headquarters in Dublin, IDA Ireland has 15 overseas offices as well as a director and staff in each region in Ireland.

Its activities include the international and national promotion of Ireland as an industrial base for overseas investment, the provision of financial incentives (including grant-aid) for the attraction of new overseas investment into Ireland and the expansion of its existing client base of almost 1,300 companies, along with product and process development and feasibility studies, where appropriate.

Administrative costs associated with science and technology activities were nil in 1999 and are estimated at nil in 2000, as no separate staff are assigned to administer either Research & Development or Feasibility Study Grants.

Research and Development

	£'000	
	1999	2000
Product and Process Development:	3,878	4,000
	(€4,924)	(€5,079)

Grant assistance is provided in support of product and process development projects carried out either in-house or by sub-contractors, e.g. Enterprise Ireland or private consultants. R&D Facility grants are available to assist in the purchase of plant and equipment related to research and development. In general, any grant assistance is subject to a maximum of £250,000 (€317,434) or 50% of eligible expenditure of £500,000 (€634,869).

44 companies were approved for grant-aid of £5.2m (€6.6m) in 1999 and grant payments totalling £3.878m (€4.924m) were made, all of which was reimbursed from Enterprise Ireland under Measure 1 and Research Technology & Innovative (RTI) initiatives of the EU Operational Programme for Industrial Development. The 2000 estimate is £4.0m (€5.1m), inclusive of the R&D Capacity Grant Scheme and Measure 1 and RTI initiatives. Any grant assistance paid under the Measure 1 and RTI initiatives will be reimbursed from Enterprise Ireland.

Feasibility studies:	42	50
	(€53)	(€63)

Feasibility study grants are available to enable firms to evaluate new product and new market opportunities. Grant assistance towards feasibility studies generally ranges between £5,000 (€6,348) and £15,000 (€19,046).

4 grants towards feasibility studies were approved in 1999 and grant payments totalling £42,000 (€53,328) were made. The total for 2000 is estimated at £50,000 (€63,486).

	£'000	
	1999	2000
Technology acquisition:	-	-

No payments were made in 1999 under this scheme and no payments are estimated for 2000.

Note: Allocations for grant payments can differ substantially from outturns as grants are only paid as and when the offers of grants, which require supporting expenditure by recipient firms, are taken up.

Shannon Development

Shannon Free Airport Development Company was incorporated under the Companies Acts in 1959. The Shannon Free Airport Development Company Act 1959 and several amendment Acts govern the activities of Shannon Development and provide for State equity (from the Minister for Finance), and grants for specific functions from the Ministers for Enterprise, Trade and Employment; Tourism, Sport and Recreation; Public Enterprise; and Agriculture and Food in relation to Limerick, Clare, Tipperary (North Riding), South-West Offaly and North Kerry.

Shannon Development acts under the aegis of the Ministers for Enterprise, Trade and Employment and Tourism, Sport and Recreation. Its business is regional economic development and the Company mission is:

"To initiate, participate in and support integrated development that will achieve sustained economic growth in and throughout the Shannon Region".

In implementing its unique regional development mandate, the Company adopts a number of specific but inter-linked approaches. The principal tools it uses are those for which it has statutory responsibility, namely industrial, tourism and related development in the Region.

It is financed by grant-in-aid, EU income, and own resources. The grant-in-aid for 1999 for Shannon Development's administration and general expenses related to industrial development was nil as all revenue expenditure was funded from own resources. The grant-in-aid grants to industry in the Shannon Free Zone is £7.5m (€9.5m).

Specifically in relation to its industrial role, Shannon Development develops and strengthens the indigenous industry sector in the Shannon Region, which includes building up a venture capital culture and creating awareness of the benefits accruing from the Information Society. The company continues to manage and develop specific products and manages industrial buildings and estates; grants and other financial facilities for new and existing manufacturing and internationally traded services companies. Shannon Development also manages the Innovation Centre and is a partner in the Microelectronics Applications Centre, both of which are listed separately.

The average number employed by Shannon Development during 1999 was 204.

Note: allocations for grant payments can differ substantially from outturns because grants are paid only if the offers of grants, which require a supporting expenditure by recipient firms, are taken up.

Research and Development

	£'000	
	1999	2000
Product and Process R&D:	5,114	5,250
	(€6,493)	(€6,666)

Grants of up to 50% of eligible expenditure are available to firms in the Mid-West region carrying out product and process development projects. All R&D grants paid by Shannon Development are funded via Enterprise Ireland from funds made available under a number of EU initiatives, namely Measure 1, Research Technology and Innovation Initiatives, and Measure 3 (R&D) Management. In 1999 £3.139m (€3.987m) was received from Enterprise Ireland for these programmes and IR£4.0m (€5.1m) is estimated for 2000.

	£'000	
	1999	2000
Feasibility Grants:	297	310
	(€377)	(€394)
Grants of up to 50% of eligible expenditure are provided for feasibility studies to enable individuals, groups and firms seek out and evaluate prospective new product ventures, and market opportunities. Grants paid to industries located on the Shannon Free Zone are funded from Shannon Development's grant-in-aid-grants to industry allocation. For indigenous companies in the Shannon Region, outside of the SFZ, Shannon development receives an allocation from Enterprise Ireland's grant-in-aid vote.		
Training	1,633	1,750
	(€2,073)	(€2,222)
Specialised training is given to assist in the starting-up of new high technology firms.		

NMRC

Established by the Government in 1981, NMRC now incorporates The National Microelectronics Research Centre, The National Nanofabrication Facility, ESA Microelectronics Technology Support Laboratory, Optronics Ireland Research Centre, PEI Technologies Research Centre, EU Designated Research Infrastructure. NMRC currently employ over 200 people of whom 15 are funded by the State and the remainder funded by the Centre's research activities.

The Centre was established to provide the infrastructure necessary to assist the development of a semiconductor and microelectronics industry in Ireland; it is intended as a resource centre, with specialised plant and expertise in the field of semiconductor design and fabrication technology. Its primary objectives are as follows: to provide advanced education and training in the area of microelectronics; to provide access to silicon technology (design, fabrication and testing) to other third level colleges within the State; to carry out research and development projects for industry; by taking part in co-operative EU technology projects, to act as a conduit to both industry and education in Ireland for state-of-the-art technology in microelectronics.

Since its inception, NMRC has contributed to the development of the microelectronics industry in Ireland, concentrating on co-operative problem-solving projects between the university and industry. The Centre's comprehensive range of facilities firmly establishes NMRC on the microelectronics map of Europe, providing the research, development, backup services and expertise necessary for co-operative projects between the member countries of the EU. Involvement in EU Framework Programme research projects has been a major activity over the years.

1999 was another successful year of growth and achievement at NMRC. Highlights of the year included:

Securing over £5.5m (€7.0m) in research funding in the first round of the EU fifth framework research call for proposals. The NMRC secured over 36% of the total EU funding won by Ireland in the first round of the IST fifth programme call.

- Contributions from the Department of Enterprise, Trade and Employment increased to over £2.066m (¤2.62m). The Department continue to recognise the strategic role that the NMRC plays in maintaining and up-grading the technological capabilities of the electronics industry in Ireland.
- Industry contracts accounted for a record 46% of total research income.
- Under the Higher Education Authority programme for research in Third Level Institutions 1999-2001, NMRC received funding to establish a National Nanofabrication facility (NNF) and Nanotechnology research programme at the NMRC, (valued at £10m, €12.7m).

£'000	
1999	2000
8,679	7,941
(€11,020)	(€10,083)

Research and Development

NMRC has a dual mission; firstly to be a world-class centre of excellence in Information and Communication Technologies and secondly to be a key part of the national science, technology and innovation infrastructure; supporting existing indigenous and multinational industry, providing highly skilled staff for Irish industry and stimulating new indigenous industry and inward investment from foreign companies.

Through its participation in international R&D consortia over the last 18 years, NMRC has developed its R&D expertise and technology portfolio which provide the basis for NMRC to support the long-term sustainable and competitive development of the ICT sector in Ireland and Europe. The Centre is today recognised as a world-class Centre of excellence in selected Information & Communication Technology (ICT) fields. For example, the NMRC is the only European Research Centre selected by an international review panel to participate in the European Union ICT Advanced Research Initiatives in Nanoelectronics, Optical Interconnect, Nanoscale Information Devices, Quantum Computing and The Disappearing Computer.

During the past year there have been significant changes to the internal organisation within NMRC. A new Advanced Research Division has been created underlining the significant expansion in the depth and breadth of basic microelectronics-related technological research being undertaken at NMRC. This reflects the coming to fruition of one element of our research policy initiated some three years ago of an increased involvement in basic research. We have also moved to reinforce our support to industry in the areas of new product development and technology transfer through the creation of a new Industry division which provides a single entry point to industry R&D, services and training at NMRC and the initiation of a new Industry Partnership Programme to respond to specific industry strategic innovation needs. In parallel with this, we have strengthened the links between NMRC and our external environment through the appointment of additional members to our Industry Advisory Board.

Industry Interaction

NMRC is primarily in place to strategically position Ireland to compete for the future and therefore, in addition to support for existing companies, we firmly believe that the availability of this critical infrastructure of ICT knowledge, expertise and facilities will be an increasingly strategic important factor in both stimulating the creation of new indigenous industry and in attracting inward investment to Ireland in this new knowledge-based economic era.

Multinational Companies

NMRC has an extensive network of clients throughout Europe and the US with whom we have established a track record for effective and productive R&D collaborations. These collaborations encompass multinational consortia funded directly by industry or within various European and international research programmes, as well as research undertaken for individual clients. The output from these programmes has ranged from consultancy reports to transfer of processes and technologies developed at NMRC.

- This international R&D profile has been recognised with NMRC hosting the IEEE VLSI Packaging Workshop and the European Solid State Devices Research Conference (ESSDERC) in Cork, Ireland in May and September 2000 respectively.

The following details a small sample of the highlights of the Centre's international collaborations during 1999.

- During 1999 Bourns electronics signed a strategic partnership agreement to provide their product development team in Cork with access to NMRC technology and expertise in selected technology areas.
- Artesyn Technologies launched their SXA series of surface mountable low power DC-DC convertors in March. NMRC has played a pivotal role in the development of a packaging platform for the high specification product range. Artesyn expect to leverage this platform for future new products.
- NMRC is the only research institute in Europe funded under Intel's Basic Research Programme. Intel has funded research at NMRC on advanced microelectronic packaging technologies for the last 3 years, along with supporting research students under its postgraduate fellowship programme.
- NMRC is participating with Analog Devices BV and the University of Limerick on the development of a universal "set-top" box for use with DVD players and future digital TV. The project is using data converter architecture proposed by NMRC that will allow the circuit implementation on a single chip. NMRC is also providing ongoing support to Analog in the area of IC design characterisation utilising its HP82000 and mixed signal evaluation unit. During the year, this included Analog's MicroConvertor products containing microcontroller and D/A converters.

Indigenous Companies

NMRC launched a number of new initiatives during the year that will provide Irish industry with a more transparent access to the range of capabilities and facilities available within the Centre. These include:

- The establishment of an Industry Division with responsibility for technology R&D with industry and for industry access to technology services, training and new product development;
- A series of high-level discussions with the IDA to establish how NMRC can assist the agency in developing the ICT sector in Ireland;
- The initiation of a study of the high technology indigenous sector with a view to establishing the industry's research, product development and technology support needs. This study is being undertaken in consultation with Enterprise Ireland and will culminate in a seminar entitled "Innovation and Product Development through Advanced Technology" early in 2000;
- The inauguration of a strategic partnership programme to support R&D teams, within both multinational and high technology, indigenous companies, in product development and new product innovation.

Examples of significant highlights in the Irish ICT sector during 1999 with which NMRC was associated include:

1. The opening of the new Parthus Technologies Design Centre in Cork which is managed by a former senior IC designer at NMRC;
2. The establishment by Analog Devices of an IC design centre in the Cork Airport Business Park, headed up by a former Director of CAD at NMRC;
3. The launch of a new range of power supplies by Artesyn Technologies developed at their Youghal facility with support from NMRC;
4. Analog Devices launched AD7472 which incorporates novel data converter circuits licensed from NMRC

The following pages provide further details of the Centre's industrial collaboration with Irish industry during 1999. Permission from our industrial partners and clients to publish this information is gratefully acknowledged.

Other successful collaboration included;

- The NMRC continued its collaboration in a European project that seeks to address a market requirement for low cost, in-line process sensors to monitor fat and protein in the food industry. It brings together NMRC with Kerry Foods, Listowel, the Department of Food Engineering, UCC and a number of European partners. During the year, NMRC delivered a prototype system to Kerry Foods that will be tested on their process line during 2000.

Loctite in Dublin are developing a range of novel anisotropically conductive adhesives, (ACA), for electronics assembly. NMRC assisted the company in the definition of an optimum process window for a lead-free solder-filled adhesive for use in flip-chip assembly on organic substrates. During the research programme, the reliability of flip-chip assemblies bonded with these adhesive materials was evaluated and the characteristics of the adhesive joints and solder microstructures were determined.

The NMRC also continue to support indigenous company access to advanced technology through the EU FUSE programme.

FUSE is an EU initiative with the aim of improving the competitiveness of European Industry, particularly SME's, by stimulating greater use of electronics. NMRC provides indigenous companies with support in proposal writing, technology training and access to appropriate technologies and a network of sub-contractors. To date 12 companies have received funding to incorporate new electronic technologies ranging from microncontrollers, ASIC's, microsystem components. Participating companies have included ;- Airtex, Belmount, BMS Ireland, Corkopt, Farran Technology, Mentec, Vibrotek, Western Automation R&D and Zandar.

157 research projects were in progress in 1999. Capital was provided by the Department of Enterprise, Trade and Employment to the extent of £420,000 (€533,290) in 1999 and £500,000 (€634,869) in 2000. The Centre's operating expenses are funded partly by the Department of Enterprise, Trade and Employment, £1.363m (€1.73m) in 1999 and £1.3m (€1.65m) in 2000 and by the HEA £970,000 (€1,231,645) in 1999 and £1,112,000 (€1,411,949) in 2000. In 2000 the Centre will receive £120,000 (€152,369) from the Optoelectronics Programme in Advanced Technology, (1999 £220,000 (€279,342)). The Centre will also receive £186,000 (€236,171) under the Power Electronics Programme in Advanced Technology in 2000 (1999: £353,000 (€448,218)).

	£'000	
	1999	2000
	970	3,912
	(€1,231)	(€4,967)

7.2 Technical Services and Training

The transition from research and development project to the provision of devices as a commercial service is illustrated by our continued work on radiation dosimeters. The NMRC has been developing radiation dosimeters for several years under a research contract with the European Space Agency.

Now this work has broadened its commercial focus and we are supplying radiation detectors for several companies, including Mitsubishi, for use in a variety of engineering and development programs. The Mitsubishi devices are supplied to NASDA, the Japanese Space Agency, and will be flying during 2000.

The response from the Irish electronics industry continues to be very positive with work been carried out for many major clients including MA/COM, Analog Devices, Artesyn Technologies, Connaught Electronics, EMC, Moog and Parthus Technologies. We look forward to the continued expansion of this important area and the strengthening of our support for Irish Industry.

The IC test laboratory provides electrical and physical evaluation of IC's at package and wafer level. Test resources include two HP82000 systems, two HP4062UX systems and a HP8722 based RF measurement system. In addition, an SRP doping profiler and emission microscope are used for process debugging as well as supporting industry projects that require IC design characterisation, patent infringement investigation, smart-card security assessment, process evaluation, low level measurements and RF characterisation. This laboratory continues to support such multinationals as Analog, EMC, Parthus Technologies, etc.

7.3 Training

The current worldwide shortage of skilled people is now recognised as the key-limiting factor to growth in the ICT industry. NMRC is involved in a number of initiatives both to address specific existing skills shortages in selected areas of the ICT sector and to ensure the availability of skilled personnel in future emerging ICT fields.

These initiatives include full-time and part-time undergraduate and post-graduate programmes, industry-wide technical support groups, industry skills groups and, looking towards future generations, participation in activities to promote science and technology in the second-level educational system.

The NMRC is the premier training and education facility in ICT related technologies in Ireland. Currently, the centre hosts a total of 98 full-time and part-time (industry-sponsored) postgraduate places, which is the largest body of postgraduates in a research centre in the country. A recent survey of past graduates has shown that over 350 have graduated from NMRC of which over 50% are currently working in Ireland with an increasing number of foreign-based NMRC graduates now returning to take up employment with companies in Ireland.

It is pleasing to see the growth by a factor of two over the last three years in the number of engineers and scientists from industry participating in the part-time post-graduate programmes, reflecting the relevance of NMRC training programmes to industry. More than 50 staff have been sponsored by Irish companies on these programmes. These participating companies have included Analog Devices, Artesyn Technologies, BCO Technologies, EMC, Farran Technology, General Semiconductor, M/A-Com Eurotec, Mentec and Parthus Technologies.

Within the ICT sector in Ireland, there is currently a shortage of engineers with integrated circuit design skills. During 1999, NMRC was instrumental in the establishment of the IC Design Skills Group consisting of over 30 representatives from Irish industry, the industry development agencies and the Universities with the aim of addressing this skills shortage. NMRC has responded to the initiative by developing three new Digital IC Design courses aimed at complementing companies' in-house training programmes during the coming year.

NMRC has been presenting training courses on both Semiconductor Processing and IC Design for a number of years aimed at electronics manufacturing companies and companies supplying services to the electronics industry. Over the last 5 years over 200 places have

been offered to over 50 companies from both Ireland and Europe. Irish companies participating on the courses have included IBM, EMC, Air Products, GSI, BOC and the FÁS Training Centre in Cork. European-based companies that have participated include IC Design Courses - Zandar Technologies, Dell Computers, Silicon & Software Systems and EMC.

A new range of training courses is to be made available to industry in the coming year, including the following:

- Semiconductor Processing Technologies;
- Advanced Electronics Assembly Technologies;
- Product Reliability Assessment and Failure Analysis;
- Thermomechanical Analysis and Characterisation of Microelectronic Assemblies;
- IC Design Courses including Digital IC Design and VLSI Layout and Simulation.

The National Research Support Fund Board, which is a joint initiative between the Office of Science & Technology and Enterprise Ireland, sponsors the NMRC Facility Usage Scheme (FUS) with the objective of promoting usage of the Centre's research facilities by higher education institutions in Ireland. The programme has sponsored over 20 projects from Irish Universities and Institutes of Technology including TCD, UCD, UCG, UL, DCU and CIT. During 1999, FUS projects were funded in Thin Film Electroluminescent Displays using Sol-Gel Processing (Dublin City University) and Material Characterisation of Shallow Junctions (Trinity College Dublin). It is anticipated that the programme will be expanded in the coming year to facilitate access to the recently funded National Nanofabrication Facility at NMRC.

Technology Licensing & Patenting

The intellectual property (IP) portfolio of NMRC continues to expand with the filing of eight additional patents in the last year. The Centre is now developing this resource with the twin aims of maximising the transfer of its technology to industry and the generation of license income to fund further research.

Currently, the Centre's patents are being promoted to technology brokers and companies in Europe, the US and Japan and the positive feedback is underpinning a new initiative within the centre on the generation of an entrepreneurial spirit for the benefit of the regional and national economy. It is anticipated that this proactive focus will, over the coming years, result in an expansion of the ongoing success of the centre in commercialising its intellectual property portfolio through technology transfer and licensing agreements, joint ventures and start-up companies.

The following represents a selection of technologies and prototypes recently added to the NMRC's IP portfolio for which exploitation routes are actively being pursued.

- Novel Method of Selective Activation and Metallisation of Materials;
- Miniature RF Transceiver on Multi-chip Module;
- Integrated Magnetic Components in Printed Circuit Boards;
- Silicon-based High Sensitivity, Magnetic Field Sensor;
- Thermal Imaging using CMOS-compatible Infra-red Sensor Arrays;

- Toxic-Metal Sensors for Environmental Analysis of Water;
- Low cost system for On-line Analysis of Liquids using NIR Microspectroscopy.

The IC design and microelectronic manufacturing community continues to increase its emphasis in both intellectual property protection and capitalisation. NMRC has developed extensive capabilities in the area of "patent portfolio management" which encompasses characterisation and analysis work on intellectual property. Projects at NMRC during 1999 were concerned with DSP & mixed signal products.

The Patents Office

The Patents Office and the Office of Controller of Patents, Designs and Trade Marks were established originally under the Industrial and Commercial Property (Protection) Act, 1927 and continued in being by the subsequent Patents Acts of 1964 and 1992. The Patents Office is under the control of the Controller whose functions are set out in the Patents Act, 1992 amended by the Intellectual Property (Miscellaneous Provisions) Act, 1998, the Trade Marks Act, 1996, the Copyright Act, 1963, the unrepealed provisions of the Industrial and Commercial Property (Protection) Acts, 1927 to 1958, and the Statutory Rules made under these enactments. The scope of the Office's activities stems from these statutes and rules.

The principal statutory functions of the Office are the granting of patents, the registration of industrial designs and trade marks and providing information in relation to patents, designs and trade marks. The Controller has certain limited functions under the Copyright Act, 1963, in relation to copyright disputes.

The Office's expenditure is funded out of monies voted to the Department of Enterprise, Trade and Employment. The Office's revenue from fees for the registration, etc. of patents, designs and trade marks and sales of publications is subsumed into the Exchequer. The fees and sales of the Office resulted in a surplus over costs of £3.1m (€3.94m) in 1999; the estimated surplus for 2000 is £2.2m (€2.79m).

At 1 January 2000, a total of 72 permanent staff were employed at the Office, of which 16 provided administrative support across the various functional areas set out below.

	£'000	
	1999	2000
Information Services	319	303
	(€405)	(€385)
Patents	778	730
	(€988)	(€927)

Information Services

Comprehensive library services are available and include details of published applications and legal and technical works of interest to inventors and those interested in patents, designs, trade marks and copyright, including current applications and proposals.

6.5 staff are employed in this activity.

A fortnightly journal is published which details the business of the Patents Office. Income arising from the sale of this, and other publications, amounted to approximately £6,800 (€8,643) in 1999; £12,000 (€15,236) is the expected income in 2000.

Patents

15.5 staff are involved in the processing of applications seeking the grant of patents, i.e. rights preventing parties other than the patentee from exploiting an invention.

Ancillary activities include examination of requests for extensions of the term of patents, restorations of lapsed patents, changes of proprietorship, registration of patent agents and grant of supplementary protection certificates for pharmaceutical products.

1,114 applications were received in 1999, including 590 applications for short-term patents under Part III of the 1992 Act. Of the 320 patents granted, 148 were short-term patents. In 1999, the number of European patents designating Ireland was 6,968 (see below "International Collaboration").

Patent fee income was approx. £3.185m (€4.04m) in 1999 and the income from Patent fees in 2000 is expected to be similar to that achieved in 1999.

	£'000	
	1999	2000

Designs and Trade Marks

	1,662	1,560
	(€2,110)	(€1,981)

34 staff are involved in the examination of applications seeking (a) registration of designs, i.e. features of shape, configuration, pattern or ornament intended to be applied to any article; and (b) registration of trade marks, i.e. marks for the purpose of distinguishing the goods of the owner of the mark from those of other traders. Ancillary activities include trade mark renewals, assignments, removals, oppositions and the registration of trade mark agents.

657 design applications were received in 1999 and 576 were registered.

Design fee income is estimated to be £89,000 (€113,000) in 1999 and the income generated from Design fees in 2000 is expected to be similar to that achieved in 1999.

4,518 trade mark applications were received in 1999 and 5,464 were registered.

Trade mark fee income is estimated to be £2.89m (€3.67m) in 1999 and a similar amount of fees is expected in 2000.

On 1 April 1996, the Community Trade Mark system came into being with the opening of the Office for Harmonisation in the Internal Market (O.H.I.M.) in Alicante, Spain. Under Article 39(3) of Council Regulation No. 40/94 of 20 December 1993 on the Community Trade Mark (C.T.M.), the Office searches every C.T.M. application and conveys the result of its searches to the O.H.I.M.; the result of every search must be with the O.H.I.M. within three months of the date on which the Office received the C.T.M. application from the O.H.I.M. During 1999, the Office received 44,109 C.T.M. applications for searching under the above regulation and by the end of the year had forwarded the results of searches in respect of 610 C.T.M. applications to the O.H.I.M. However because of the inability of the Office to keep up with the searching of O.H.I.M. applications (this arose as a result of the reduction in the Office's authorised number of search staff from six to two) and in order not to neglect the processing of national applications, it was agreed that searching of C.T.M. applications should cease for the time being in favour of national trade mark applications. The cessation became operative in January 1999. As at the end of 1999, this work remained suspended.

International Collaboration

	280	305
	(€356)	(€387)

Consequent on Ireland's ratification of the European Patent Convention with effect from 1 August 1992. There has been a significant decrease in the number of applications seeking national patents filed directly at the Patents Office. At the same time, a correspondingly much greater number of European patent applications designating Ireland are being made to the European Patent Office.

During 1999, staff from the Office represented Ireland at meetings of the European Patent Organisation (EPO) and at meetings at the World Intellectual Property Organisation (WIPO) on various intellectual property issues.

Since October 1993, the Department of Enterprise, Trade and Employment has assumed responsibility for legislative and policy matters in the field of intellectual property.

MAC

MAC, The National Microelectronics Applications Centre Ltd, in Limerick, was established in 1981 to actively improve the competitiveness and more rapid development of Irish industry through the application of electronic and information technology. Its mission is to work with customers and partners in the profitable application and productisation of advanced electronics and information society technology. Over the years MAC has a developed a strong reputation and track record of working with customers and partners in the profitable application and creative productisation of advanced electronics and information society technology.

MAC's primary activity is the contract development of new and improved electronic, software and information society technology products, processes and services for Irish entrepreneurs, industry and public sector organisations. This extends from pre-feasibility consultancy, through technological/commercial feasibility, specification, design, development, sourcing, prototype building, tooling, technical literature, sub-contractor sourcing and total manufacturing management. MAC is particularly experienced in "productising" products, services and process applications to function to specific levels of accuracy, cost, reliability and robustness, in hostile real-world environments.

MAC also develops, hosts and offers consultancy on Internet-based transactional multimedia e-commerce applications and services, both fixed and mobile, for companies and public sector organisations. MAC's other services include project, technology and manufacturing management, technical and feasibility studies, and development of EU project consortia and proposals.

MAC works closely with companies and entrepreneurs on its technological solutions for them, and to date has delivered over 220 product developments, 30 online services, 175 process applications, 450 consultancy projects, and has investigated over 3,000 preliminary ideas for high technology products.

MAC's shareholders are Shannon Development, Enterprise Ireland and the University of Limerick. As well as these, its Board includes directors from the Department of Enterprise, Trade and Employment, IDA Ireland, Eircom and private industry.

MAC employs a total of 15 permanent staff, together with a varying number of short-term contract personnel.

	£'000	
	1999	2000
Technological Development	765	610
	(€971)	(€775)

Technological Development

Electronic, software and information society technology products, services and process developments including up-grading existing products, technical consultancy and project management and information brokerage, Internet/World-Wide-Web e-commerce services, automated processes, special purpose process equipment and data gathering systems, are carried out on a contract basis for firms.

48 projects were completed in 1999.

Expenditure figures include fee income of £665,000 (€844,376) and £610,000 (€774,540) in 1999 and 2000, respectively. As in previous years, and in common with the expenditure figures of other agencies the expenditure figures exclude depreciation charges.

Foras Áiseanna Saothair (FÁS)

In accordance with the Labour Services Act, 1987 -AnCO - The Industrial Training Authority, The National Manpower Service and the Youth Employment Agency were amalgamated on January 1, 1988. An Foras Aiseanna Saothar (FÁS), the National Training and Employment Authority replaces these three agencies.

On June 12th, 2000, responsibility for training and employment activities for people with disabilities was transferred from the National Rehabilitation Board (NRB) to FÁS. Seventy-one NRB staff have transferred also and they will gradually integrate their work into that of FÁS. The development of future training and employment services for people with disabilities will take place within FÁS on an incremental basis, in consultation with representatives of people with disabilities and relevant Agencies. This process has already begun within FÁS and will continue during 2000.

The functions of FÁS, the National Training and Employment Authority as defined in the Labour Services Act (1987) are:

The provision of training and retraining programmes for employment (whether directly provided by FÁS, or contracted out to external Agencies); the provision of Employment Schemes; providing Community groups with training and developmental supports in their enterprise and employment creation activities; providing employment and placement services, both to employers and the unemployed; assisting Irish people to obtain employment in other EU states (primarily through its SEDOC service) and providing advice and counselling for those of our citizens who wish to emigrate.

In the spring of 2000, FÁS also assumed responsibility for providing its services to asylum seekers and a Special Unit for this purpose was established within FÁS.

In 1999 FÁS had expenditure, including capital, of £537m (€682m). Its non-capital budget for 2000 is £553m (€702m).

FÁS is the largest non commercial State Agency, employing a total of 2075 staff nationwide. During 1999 FÁS catered for 39,858 people on its training programmes (including apprentices) and on Schemes catered for 58,919.

Education and Training

Training Programmes with a Science and Technology Focus:

FÁS provides a wide range of training courses for unemployed people. The operational cost of providing these courses (excluding any apportionment of overhead costs, depreciation or capital costs) was approximately £21.1m (€26.8m) in 1999, £8.0m (€10.2m) of which is estimated to come from the EU.

£'000	
1999	2000
21,139	28,240
(€26,841)	(€35,857)

The Innovation Centre

The Innovation Centre was established at the National Technological Park, Limerick, by Shannon Development and the University of Limerick in 1980.

Playing a pivotal role in Shannon Development's responsibility for the promotion and development of industry in the Shannon Region, the Innovation Centre provides an integrated system for incubating and growing high potential companies, which have the following characteristics:

- Comprise a venture team;
- Are technology-based;
- Provide internationally traded output;
- Provide skilled employment.

The Innovation Centre offers its clients a core range of quality business incubation and growth programmes and facilities:

- Entrepreneurs Programme;
- Incubator Business Accommodation and Services;
- Campus Enterprise programme;
- Business Growth Programme;
- Comprehensive Package of Client Support Services.

The Innovation Centre is financed by Shannon Development (£280,000 (€355,527) in 1999 and budgeted for £295,000 (€374,573) in 2000) through ERDF grants (£270,000 (€342,829) in 1999 and budgeted £270,000 (€342,829) in 2000).

Seven Shannon Development staff are based at the Centre.

	£'000	
	1999	2000
	£795	£765
	(€1,009)	(€971)

Innovation Management Services

The Centre provides a range of facilities including workshops (subsidised rent), a machine workshop, financial and technical feasibility studies, product development, assistance and access to all national grant programmes.

The Entrepreneurs Programme will be the main source of projects during 1999/2000. Under this programme, entrepreneurs attend evening courses in all aspects of business development, particularly in high technology industries.

National Standards Authority of Ireland (NSAI)

NSAI operates under the National Standards Authority of Ireland Act 1996, on behalf of the Minister for Enterprise, Trade and Employment, for the publication of national standards and the provision of a comprehensive product and management system certification service. The governing board of NSAI is appointed by the Minister, and represents a cross-section of industrial and government interests.

The NSAI Standards Programme is vital to the support of industry in Ireland, particularly to indigenous companies, in providing it with the opportunity to take part in and influence the formulation of the European Standards which are so important for trading in the EU Single Market. Industry, Consumers and Government Departments participate in the standards development process under the umbrella of the NSAI standards programme.

The NSAI Certification Service, provides industry with independent third party certification services to indicate conformity with national and international standards that are recognised world-wide. The Authority is accredited by the National Accreditation Board (NAB) for EMAS, ISO14001 (Environmental Management Systems) and ISO9000 (Quality Management Systems). It is also accredited by the Registrar Accreditation Board (RAB) in the United States for ISO9000, ISO14001, QS9000 (Automotive Industry), TI9000 (Telecommunications Industry) and by the VDA for VDA 6.1 (Automotive Industry).

The development of the NSAI has provided the necessary support for industry, both in providing access to technical work of the development of European Standards by experts from industry in Ireland and in the certification of products and services to them.

£'000	
1999	2000
10,599	10,861
(€13,458)	(€13,791)

Technical Services

During 1999 more than 800 experts from industry and third level institutions in Ireland participated in the nineteen NSAI Consultative Committees and their sub-committees, which provided a national input to the work of European and international standardisation. 160 Irish experts from industry and other areas participated in the work of European and international standards meetings abroad, bringing together European and international experts in a wide range of technical fields. In addition, draft European and international standards were circulated to 650 individual experts in Ireland. Participation in the technical committees provides an excellent forum for the exchange of expertise and knowledge between Irish experts and their counterparts abroad.

In addition, NSAI provides a "Standards Information Service" to approximately 600 Irish companies giving regular details of the progress on Irish, European, and International standards and relevant technical legislation. The nineteen national consultative committees of NSAI provide sectors of industry with the means of exchanging views on standards related to their interest.

The Standards Publication Department publishes in the region of 2000 standards per annum, predominately these are European Standards which are transposed into Irish standards.

Certification Services

Over the past 12 years NSAI has played a significant role in enabling indigenous and multi-national companies achieve world-wide recognition of their quality and environmental management system. To date NSAI has registered over 2,400 companies with Quality Management Systems against ISO9000 and over 1,500 products for conformity to individual standards.

145 companies are now certified to the ISO14001 Environmental Management Systems Standard and 3 companies have been certified to EMAS.

Irish Agrement Board

The NSAI undertakes national technical approvals and publishes Agrement Certificates for Innovative construction and civil engineering products under Irish Building Regulations and in accordance with the rules of he international union of Agrement bodies UEATC.

During 1999 the Agrement service

Received

- 71 manufacturing / marketing enquiries
- 22 Product / System Applications

Issued

- 9 Agrement Certificates
- Work in Progress
- 48 Certification projects

Legal Metrology Services:

1999 marked the continued consolidation of the Legal Metrology Services within the NSAI. The service was transferred to NSAI in mid 1998 having been established as a new national service within Forbairt in May 1997.

The service is responsible for ensuring fair trade and open competition through the maintenance of:

- a system of units of measurement
- Public confidence in the accuracy of measuring instruments used in trade and in the quantities of goods traded throughout the economy.

These responsibilities were met by the implementation of control procedures comprising of type approval of new designs of measuring instruments, verification and regular inspection of instruments to ensure continued measurement accuracy.

During 1999:

- 11,313 instruments were inspected
- 8,324 measuring instruments and 2.14 million capacity serving measures intended for use in the licensed trade were verified.

The Department of Education & Science

The Department of Education & Science was established under the Ministers and Secretaries Act 1924 and is responsible for the administration of public education, i.e. first-level, second-level and third-level.

The Department's total allocation for 2000 is £3,066m (€3,893m). Of this, the allocation to S&T activities is £376m (€477m). This is mainly to fund scientific and technical activities in the Institutes of Technology. It is also used to fund grants and scholarships to enable students to pursue S&T courses in third level colleges.

Expenditure and programmes for the Higher Education Authority and the Dublin Institute of Advanced Studies are listed separately.

Under the Community Support Framework 1994 – 1999, the Department received assistance from the European Social Fund in respect of a number of the S & T related programmes operated in the Institutes of Technology under the Operational Programme for Human Resource Development and the Operational Programme for Industrial Development. The programmes are as follows:

Operational Programme for Human Resources Development

1. Middle Level Technician and Higher Technical and Business Skills Programme comprising one and two year certificate courses and three year ab-initio and one year "add-on" Diploma Courses.
2. The Advanced Technical Skills Programme comprising post-graduate level courses which focus on identified skill gaps at the highest level in key sectors of the economy. The ATS is complemented by the Graduate Training and Enterprise Development programmes funded under the Operational Programme for Industrial Development.
3. The Training of Trainers Programme is an ESF-aided staff development scheme under which funds are made available to provide training for staff in the Institutes of Technology.

Operational Programme for Industrial Development:

1. The Graduate Training Programme supports education and training in advanced research and development techniques and new technology applications for graduates, leading to a Masters degree.
2. The Enterprise Development Programme provides graduates with training to develop the R&D skills required to establish a business through new product development.

The expenditure figures listed below do not include the Department's internal administrative overheads associated with these programmes. The Department has 1020 authorised staff.

	£'000 1999	£'000 2000
Education & Training		
Institutes of Technology:	147,177 (€186,876)	205,872 (€261,403)
Funding of the scientific and technical activities in the Institutes of Technology.		
Support for third level S&T education accounts for approximately 70% of the total exchequer grant for Institutes of Technology (Vote for Third-level and Further Education).		
Included are capital grants of £27.47m (€34.88m) and £54.81m (€69.59m) for 1999 and 2000 respectively, of which £17.57m (€22.31m) came from EU Structural Funds.		
Structural funds supporting Graduate Training, Enterprise Development, Training of Trainers, Middle Level Technician/Higher Technical and Business Skills and Advanced Technical Skills amounted to £40.45m (€51.36m) in 1999.		
Funding under the new Community Support Framework for 2000-2006 has not yet been finalised. EU support is being sought for the Undergraduate Skills measure, for which provision of £15.4 million (€19.55m) has been made for 2000. Its objective is to support the additional third level places being made available to meet skills need in high technology industries, particularly in areas such as information and communications technologies, hardware electronics and software. EU support for this provision is expected to amount to £8.47 million (€10.75m) in 2000.		
Third Level Grants:	35,946 (€45,642)	42,089 (€53,442)
Provision of Higher Education grants to enable students to pursue S&T courses in third level colleges and institutions. Approximately 32% of Higher Education grant holders are pursuing S&T courses. Grants paid to students pursuing university courses are included in the HEA figures.		
Provision of Third Level Scholarships enables students to pursue S&T courses in third level colleges and institutions.	273 (€347)	273 (€347)
Provision of VEC and ESF Student maintenance grants to pursue S&T courses. The VEC and ESF fee grants are included in the fees received by the Institutes of Technology. Scholarships are paid to Irish students to attend the College of Europe, Bruges.	34,995 (€44,434)	37,428 (€47,524)
Research and Development		
Third-Level Research & Development Activities	7,000 (€8,888)	12,500 (€15,817)
An allocation of £12.5m (€15.9m) has been provided in 2000 for current spending on research and development. This provision is available to all universities and Institutes of Technology to support the development of their research capabilities, to support outstandingly talented individual researchers and to encourage co-operation within institutions and between institutions. This funding will be allocated for research in humanities, social sciences and science and technology.		
The Higher Education Authority has been asked to develop proposals and mechanisms for expenditure of this research and development provision on the basis of making funding available to Universities and Institutes of Technology through a competitive process.		

	£'000 1999	£'000 2000
The Department will directly support a number of educational research projects through its research and development committee.	251 (€318)	282 (€358)
Support is being provided for certain projects jointly with the EU. In 2000 activities will include: (i) LEONARDO - the Vocational Preparation and Training of young people in the context of the EU Action Programme in Education (ii) Socrates Action Programme	425 (€539)	696 (€883)
Contributions to the budget of the European University Institute (Italy) and support of Irish students to pursue research projects.	70 (€88)	106 (€134)
Provision of Senior Visiting Fellowships to enable senior scientists or engineers from Ireland to go to other countries to study new techniques or developments, and to enable qualified specialists from other countries to be invited to come to Ireland for a period in the capacity of advisers. The scheme is administered by the Royal Irish Academy.		
Provision of Post Doctoral Fellowships	317 (€402)	317 (€402)
Support for research activities in the field of education in St. Patrick's College, Drumcondra, Dublin.	748 (€950)	810 (€1,028)
Scientific & Technological Education (Investment) Fund	64,491 (€81,887)	11,617 (€14,751)
The passing of the Scientific and Technological Education (Investment) Fund Bill 1997 by both Houses of the Oireachtas resulted in the establishment of the Fund which is used to develop technology education at all levels ranging from primary schools to advanced research. The three main objectives of the Fund are:		
► to review, extend and modernise the infrastructure of third level institutions, particularly in the technological sector.		
► to develop new areas of activities where emerging skill needs have been identified.		
► to invest in promoting innovation to maintain and further our economic growth.		
International S&T Activities	275 (€349)	310 (€393)
Irish contribution to UNESCO, the International Institute for Education Planning, and the International Centre for Registration of Serials.		

Higher Education Authority (HEA)

The Higher Education Authority (HEA), which is under the aegis of the Minister for Education and Science, is a body corporate with perpetual succession, established in May 1972 under the provisions of the Higher Education Authority Act, 1971. The HEA has the following general functions:

(a) furthering the development of higher education

(b) assisting in the co-ordination of State investment in higher education and preparing proposals for such investment

(c) promoting an appreciation of the value of higher education and research

(d) promoting the attainment of equality of opportunity in higher education

(e) promoting the democratisation of the structure of higher education.

In addition, it has the following specific functions:

(a) advising the Minister on the need for establishment of new institutions of higher education, on their nature and form, and on legislative measures in relation to their establishment (or in relation to existing institutions)

(b) maintaining a continuous review of the demand and need for higher education

(c) making recommendations to the Minister on provision of student places and the balance between institutions

(d) making recommendations for financial provision for higher education and research, either in relation to current or future periods

(e) instituting and conducting studies on problems of higher education and research, and publication of reports of such studies

(f) payment to institutions of higher education out of monies provided by the Oireachtas, such amounts as may be approved by the Minister (with the consent of the Minister of Finance).

Approximately 57% of current exchequer expenditure, provided by the HEA, and 67% of non-exchequer expenditure is for the area of science and technology. The analysis to derive that part of the HEA block-grant attributable to R&D in the 1999 and 2000 science budget deviates from that used in previous years. A distinction is now made between HEA block-grant allocated to academic departments and administration and support services. Based on the results of surveys of R&D activity in the HE sector it is estimated that 29.9% of the S&T activity in academic departments is research and development.

	£'000	
	1999	2000
S&T Education and Training	146,139 (€185,558)	158,116 (€200,766)
General support for undergraduate education and training in the following faculties in universities and other designated higher education institutions: engineering and related sciences; architecture; medical and related sciences; natural sciences.		
Provision of equipment to support S&T education and training.	1,688 (€2,143)	5,000 (€6,349)

	£'000 1999	£'000 2000
Research and Development		
General Promotion of Knowledge:	66,362 (€84,262)	69,771 (€88,591)
General support for R&D activities in the relevant faculties in universities and other designated higher education institutions, i.e. implicit support for R&D contained in the HEA allocations to individual colleges and institutions together with external sources and research funds.		
In addition to funds for R&D which are implicit in the HEA's grant to colleges because of the integral part which research plays in the working time of academic staff, third level colleges earn or are awarded grants for research from a variety of sources. These funds are included here for completeness but are not part of the HEA budget to colleges. These figures include funds from the various Operational Programmes which award research grants to university researchers.		
Enterprise Ireland also funds research in the university sector and the 1999 contribution of £7.1m (€9.02m) and the 2000 allocation of £7.6m (€9.7m) are included in these figures.		
In all, the net exchequer (including CSF funds) contribution to university research amounted to £35.3m (€44.8m) in 1999 with an allocation of £36.8m (€46.7m) in 2000.		
Provision equipment to support R&D activities in the HE sector.		
Administration and Support	58,102 (€73,774)	58,237 (€73,946)
Funds for central administration and services in support of S&T activities.		
Buildings	10,108 (€12,834)	4,700 (€5,968)
In 1999, £10.1m (€12.8m) was provided for S&T buildings in third level colleges and £4.7m (€5.9m) is allocated in 2000.		
Skills Need Initiatives	7,182 (€9,119)	24,852 (€31,555)
The Minister for Education announced on 11 July, 1997, that the Government had approved an immediate capital investment for 1997 to meet emerging and critical skills demands in the high-technology sector.		
This initiative represented the Government's immediate response to meeting the skills needs identified by high-technology companies who are concerned about the effect which the lack of suitably trained employees will have on their ability to expand.		
Equipment Renewal Programme	3,327 (€4,224)	6,673 (€8,473)
Government capital investment in equipment renewal in third level institutions.		
Programme for Research in the Third Level	-	31,858 (€40,451)
In November 1998 the Government launched a major investment programme for research in the higher education sector intended to raise the standard of research activities to the forefront of the international community. The total value of the programme, which runs from 1999 – 2000, will be over £200m (€253.9m).		

The Dublin Institute for Advanced Studies

The Dublin Institute for Advanced Studies is a statutory corporation established in 1940 under the Institute of Advanced Studies Act, 1940. The Institute has three constituent schools – the School of Celtic Studies (not included in the Science Budget), the School of Theoretical Physics and the School of Cosmic Physics. Each school has an independent governing board. The Institute, through the constituent schools, pursues fundamental research and trains advanced students in methods of original research.

The Institute is financed by an annual grant-in-aid from the Department of Education with small additional income from sales of publications and from other agencies.

There are sixty three full time staff and eighteen research scholars working in the Institute, of whom thirty two are engaged in scientific research, eight within the School of Theoretical Physics and twenty four within the School of Cosmic Physics.

Expenditure data include general overheads equivalent to an average of 32% of the figures shown.

	£'000	
	1999	2000
Research		
The School of Theoretical Physics:	388	400
	(€493)	(€508)
The school pursues basic research in theoretical particle physics; classical statistical mechanics; quantum statistical mechanics and quantum electronics. The School pursues applied research in queuing theory for telecommunications which is closely related to the basic research carried out in classical statistical mechanics.		
The School of Cosmic Physics:	1,186	1,186
	(€1,506)	(€1,506)
The school conducts theoretical and experimental work in astronomy, astrophysics, space physics and geophysics.		
Information and Specialist Services		
The School of Theoretical Physics:	128	175
	(€163)	(€222)
Provides information and advisory services in the following areas: theoretical particle physics; classical statistical mechanics; quantum statistical mechanics; quantum electronics; probability theory applied to telecommunications.		
The School of Cosmic Physics:	415	410
	(€527)	(€521)
Information on astronomical and geophysical phenomena is provided to Government Departments, to educational authorities, to the Garda Síochána and to the legal, engineering and medical professions etc. The School administers observing facilities in the Canary Islands on behalf of all Irish astronomers and co-ordinates use of the Hubble Space Telescope and provides a public education service through the Open Night Programme at Dunsink Observatory.		

Department of the Environment and Local Government

The mission of the Department of the Environment and Local Government is to ensure, in partnership with a strengthened local government system and with its specialised agencies, that Ireland has a high quality environment where infrastructure and amenities meet economic, social and environmental needs and where development is properly planned and sustainable. To this end, the Department is responsible for a range of services, provided mainly through the local government system, including environmental protection, physical planning, urban renewal, roads, road traffic, vehicle and driver licensing, water supplies, sewerage, housing, fire protection and building control. It also has responsibility for the local government system (including structures, personnel, finance and audit), construction industry matters and franchise and electoral systems.

The annual estimate for the Department in 2000 is in excess of £1.6 billion (€2 billion).

The Department employs over 850 staff. The Department also funds the National Roads Authority and the Environmental Protection Agency, which are considered separately in this document, as well as the Medical Bureau of Road Safety.

	£'000	
	1999	2000
	1,085	1,233
	(€1,378)	(€1,566)

The Medical Bureau of Road Safety

The Medical Bureau of Road Safety was established in November 1968 under Part V of the Road Traffic Act, 1968. The Bureau's principal function is to carry out analyses, for their alcohol content, of specimens of blood and urine, provided for the Gardaí by people suspected of drink driving offences. The Bureau issues certificates in respect of the results of these analyses, which may be used as evidence in prosecutions for such offences.

Other functions of the Bureau include:

The provision of equipment to the Gardai for the taking of specimens, the approval of apparatus for indicating the concentration of alcohol in breath, blood or urine and research on the effects of alcohol and the taking of drugs in relation to driving, including the methods for determining the amount of alcohol or drugs in a person's body. Under the Government Strategy for Road Safety in 1998 – 2002, the Bureau has been involved in the introduction of evidential breath testing by the Gardai through the supply and testing of equipment and the provision of training. Also as part of the Strategy the Bureau is commencing a major two year drug analysis programme in 2000.

The Bureau is financed by an annual grant from the Department of the Environment and Local Government. The Board of the Bureau consists of five members, including the Director, appointed by the Minister for the Environment and Local Government. The premises and staff are provided by University College, Dublin at Earlsfort Terrace on a repayment basis.

Funding of the Medical Bureau of Road Safety for 1999 was £1.085m (€1.378m) by way of a grant from the Department. The 2000 allocation is £1.233m (€1.566m).

	£'000	
	1999	2000
Planning Research	£66	£68
	(€84)	(€86)

This function which was formerly the responsibility of the Environmental Research Unit, monitors and evaluates the implementation of planning legislation at local authority level by providing: Annual Statistics on Planning Control and Administration; Quarterly Statistics of Planning Applications and Decisions; Annual Inventories of Environment Impact Statements and regular sample surveys of the operation of the Development Process.

Information searches in relation to Guidance Notes and Development Plan preparation are carried out. Some work is also ongoing in relation to the use of G.I.S.

Construction Research	96	99
	(€122)	(€126)

A Forum for the Construction Industry was established in 1997 to oversee the implementation of almost 90 recommendations contained in the Strategic Review of the Construction Industry report. The Forum provided its second Annual Report to the Minister in December, 1999, which showed that 90% of the recommendations were on target to complete implementation by end 2000.

Technical support for the Forum for the Construction Industry was provided during the year. The parameters of sustainable construction, with particular reference to the Irish environment, are under study and specific lists of actions will be developed. Work on the development of codes and standards under the EU Construction Products Directive is continuing in association with the National Standards Authority and the Irish Agrement Board. A revised and updated edition of the Recommendations for Site-Development Works for Housing Areas was published in November, 1998. Indices for the Formula Method for price variations on construction contracts have been developed and maintained. Studies by the EU of construction price parity were completed and a new set is dealt with each year.

Following the launch of a revised building control package in 1997, effective from 1 July, 1998, ongoing reviews of the Technical Guidance Documents to the Building Regulations will result in the publication of revised parts to the Building Regulations.

Water Quality	70	49
	(€89)	(€62)

Under the terms of the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), Ireland and the United Kingdom prepared an environmental Quality Status Report (QSR) on that part of the North West Atlantic region extending westwards off the British mainland to the edge of the continental shelf i.e. OSPAR Region III "The Celtic Sea". This area includes all of Ireland's marine and coastal areas. This regional report will feed into the composite report for the entire OSPAR region which should be completed in 2000.

The main Irish input into this report was published by the Marine Institute on 17 March, 1999 under the title "Ireland's Marine and Coastal Areas and Adjacent Seas: An Environmental Assessment". This report provides

- a compilation of existing knowledge (physics, chemistry, biology, human activities) of the area
- an assessment of this information in relation to agreed criteria of environmental quality
- a statement of the prevailing condition of the area.

International Collaboration

	£'000	
	1999	2000
Contributions to International Organisations:	33 (€42)	39 (€50)
Prevention of marine pollution from land based sources	16 (€20)	16 (€20)
Long range transboundary air pollution	13 (€16)	13 (€16)
Convention on climate change	4 (€5)	10 (€13)

Environmental Protection Agency

The Agency was established on 26 July 1993 by Ministerial Order made under Section 19 of the Environment Protection Agency Act, 1992.

The main objectives of the EPA are:

- to implement and enforce a system of Integrated Pollution Control (IPC) licensing for all scheduled activities throughout the country using best available technology not entailing excessive costs (BATNEEC) to eliminate or limit releases to the environment and to minimise impacts on the environment;
- to implement and enforce a system of licences for all significant waste recovery and disposal activities, including landfills;
- to promote the need to take into account environmental considerations in policies, programmes and projects undertaken by all sectors of the economy, including the public sector, based on the principles of sustainable and balanced development, the precautionary approach to pollution control and the use of clean technology;
- to prepare and update periodically a national hazardous waste plan for implementation by other public authorities;
- to encourage good environmental practices;
- to develop and implement, in co-operation with local authorities and other relevant bodies, a national integrated, decentralised, environmental monitoring programme so as to improve, standardise and expand the quality of the environment database and improve the scientific basis for better evaluation of the state of the environment;
- to evaluate the quantity and the quality of the nation's water resources to facilitate sustainable use, and the implementation of programmes to maintain and improve the quality to cater for all users;
- to oversee the pollution control and related environmental activities of local authorities and ensure that they are carried out in an effective manner;
- to assess and verify the quality of drinking water throughout the country on a regular basis, and to develop codes of practice, guidelines and manuals for the purpose of environmental protection and to improve the management, maintenance and operation of water and sewage treatment plants and landfill sites;
- to develop appropriate environmental quality objectives and corresponding environmental quality standards;
- to promote and co-ordinate environmental research;
- to assess potential and emerging environmental issues in Ireland, and relevant legislative and other developments in EU countries and internationally;
- to develop a pollution emissions register (PER) and improve the quality of information to the public;
- to improve public understanding of the environment and environmental issues and to promote greater public involvement in the protection of the environment by providing greater public access to environmental information and relevant databases.

The Agency has identified four programme areas:

- Integrated Pollution Control (IPC) Licensing and Control;

- Environmental Monitoring and Laboratory Services;
- Environmental Management and Planning (Incorporating Waste Licensing) ;
- Corporate Affairs.

The Corporate Affairs Programme deals mainly with administrative matters. The manpower and costs of this programme have been apportioned over the other three programmes for present purposes.

The Agency manages, as part of its overall programme, the Environmental Monitoring, Research and Development sub-programme of the Environmental Services Operational Programme 1994-1999.

This sub-programme provided for investment of £5.1m (€6.5m) on two Measures:

1. Environmentally Sustainable Resource Management, and
2. Cleaner Production.

The primary objective of the sub-programme is to improve environmental monitoring and data collection, and to promote research, development and innovation related to the environment.

The aims of the Environmentally Sustainable Resource Management Measure are to:

- assist in the achievement of an adequate level of research to underpin sustainable and balanced development;
- improve natural resource management for maximum sustainable use and benefit;
- develop the capability to plan for sustainable development;
- develop a reliable data gathering system and network to be able to determine the status and quality of the environment;
- adopt methods for dealing with, or reducing unavoidable wastes.

Two types of projects were eligible for funding: research and development projects and demonstration initiatives. Total investment of £3.1m (€3.9m) under this Measure is provided for in the sub-programme.

The aim of the Cleaner Production Measure is to develop approaches for encouraging manufacturing industries and the service sector to reduce waste at source and in manufacturing processes, thereby reducing costs and benefiting the environment. This measure will go beyond the traditional approach of simply adding on best available technology, to one which reviews whole production processes and makes management changes to reduce waste and emissions. It is designed to encourage a cleaner production ethos throughout the industrial and service sectors and will develop the idea of competitive advantage through environmental improvement.

Two types of project will be eligible for funding: R&D projects, and demonstration initiatives. Total investment of £2m (€2.5m) under this Measure is provided for in the sub-programme.

By the end of 1999, twenty R&D projects had been supported under the programme, all of the £5.1m total budget for the R&D programme was committed, and 90 per cent of the budget was drawn down.

In addition to larger scale R&D projects, the programme supports desk studies on topics of relevance to the Agency, where significant information gaps are identified. A total of ten small-scale studies were completed under the sub-programme by the end of 1999. In addition, twelve studies were commissioned in 1999.

The Cleaner Production Pilot Demonstration Programme was completed in 1998. Fourteen companies participated and the total cost of the programme amounted to £1.88 million (€2.39m), with funding of up to 40 per cent of costs being provided by the EU.

The Agency is currently preparing proposals for a new environmental RTDI (Research Technology Development and Innovation) programme within the context of the National Development Plan.

Research and Development

	£'000	
	1999	2000
Environmental Monitoring, R&D Sub-Programme:	362 (€460)	650 (€825)
The 1999 allocation for the two Measures funded under this sub-programme is £1.6m (€2m), £0.773m (€0.981m) of which is funded from the Community Support Framework via the Department of the Environment and Local Government. The balance will be contributed by those in receipt of research grants. Funding of research carried-out under this sub-programme in 3rd level colleges and other S&T agencies is accounted for in their respective programme descriptions.		
Environmental Monitoring and Laboratory Services:	608 (€772)	678 (€861)
This programme is concerned with the investigation of eutrophication tendencies in lakes, rivers and estuarine and coastal waters; the remote sensing of algal growth in lakes; and baseline studies of toxic and persistent substances in surface waters.		

Information and Specialist Advisory Services

IPC Licensing and Enforcement:	150 (€190)	155 (€197)
Services in relation to IPC licensing procedures and conditions are the main functions. Diagnostic/planning studies deal with the practical aspects of IPC licensing and the interpretation of BATNEEC.		
Environmental Monitoring and Laboratory Services:	760 (€965)	729 (€926)
The Agency provides general information and specialist advice to the local authorities and to the Department of the Environment and Local Government in relation to air and water quality problems and on other topics such as the implementation of EU Directives and other international agreements. Other activities include: servicing the Management Committee and the High-Level Expert Group of the European Environment Agency for which the EPA is designated national focal point; preparation of National reports on air and water quality for publication, as well as a general State of the Environment report. Other reports prepared are those dealing with revised national programmes for environmental quality monitoring and for hydrometry; development of an integrated environmental information system for Ireland.		

	£'000 1999	£'000 2000
Environmental Management and Planning: The Agency provides specialist services on subjects being researched; air/water quality management flows, hazardous and other wastes. An advisory committee on Genetically Modified Organisms is also supported. Studies are carried out on strategic planning and on environmental objectives and standards; on developing codes of practice, guidelines and manuals for the purpose of environmental protection and for improving the management, maintenance and operation of water and sewage treatment plants and landfill sites.	216 (€275)	275 (€350)
Waste Licensing and Enforcement: Services in relation to Waste licensing procedures and conditions are the main functions. Diagnostic/planning studies deal with the practical aspects of waste licensing and the interpretation of BATNEEC for the Waste sector.	110 (€140)	100 (€127)

Scientific and Technical Services

IPC Licensing and Enforcement: Implementation of the Agency's IPC licensing functions is the main technical service provided by this area.	2,421 (€3,074)	2,843 (€3,610)
Environmental Monitoring and Laboratory Services: The main services provided are in national biological and physio-chemical monitoring programmes for river water quality; measurements of riverine inputs of pollutants to marine waters; collation and processing of hydrometric data; the operation of air quality monitoring stations for NO_2 and ozone; collation of data on SO_2 in smoke from local authority air quality measuring networks; estimates of national atmospheric emissions and back-up analytical services to local authorities, including the operation of a laboratory intercalibration programme; investigations of pollution incidents.	4,807 (€6,104)	4,491 (€5,702)
Environmental Management and Planning: Services are provided in relation to the subjects being researched: air/water quality management flows; hazardous and other wastes. Implementation of licensing functions as regards waste recovery and disposal activities is a growing part of the Agency's work in this area.	732 (€929)	944 (€1,199)
Waste Licensing and Enforcement: Implementation of licensing functions as regards waste recovery and disposal activities is the main technical service provided.	909 (€1,154)	1,523 (€1,934)

National Roads Authority

The National Roads Authority was established by Ministerial Order on 23 December 1993. The Order was made by the Minister for the Environment under the provisions of the Roads Act, 1993.

The Authority's primary function, under section 17 of the Roads Act, 1993, is to secure the provision of a safe and efficient network of national roads. For this purpose it has overall responsibility for the planning and supervision of construction and maintenance works on these roads. In addition to its general mandate, the Authority has been assigned a number of specific functions under the Roads Act, including:

- preparing medium term plans for the development for the national road network;
- preparing or arranging for the preparation of road designs, maintenance programmes and schemes for the provision of traffic signs and delineation / road markings on national roads;
- securing the carrying out of construction, improvement and maintenance works on national roads, allocating and paying grants to local authorities for these purposes;
- carrying out or assisting with training, research or testing activities in relation to any of its functions;
- promoting the case for Exchequer funding and EU assistance for national roads;
- entering into agreements with the private sector for the financing, operation and management of national road projects, and
- making toll schemes for national roads.

The Research activities of the NRA are undertaken by:

- The Road Traffic, Safety and Transportation Division
- The Pavement and Materials Research Division.

The Divisions comprise the national centre for road research in Ireland and they perform two broad functions:

- to undertake research and development on road construction, maintenance, safety and transport matters of particular importance in Ireland; and
- to serve as a centre which can disseminate the findings of research in Ireland and other countries.

Both Divisions provide the National Roads Authority, the Department of the Environment and Local Government, the local authorities and their consultants and contractors with information, technical assistance and guidance related to all aspects of road construction, traffic, safety and transportation which enable them to formulate policy and plan, design, construct, maintain and operate the road system in the most cost effective manner. The technical and information services of the Divisions cater for these functions.

	£'000	
	1999	2000
Research and Development		
Road Traffic, Safety and Transportation:	221	243
Research will be carried out on traffic growth, road accidents and countermeasures, speed and seat belt wearing surveys, travel times, vehicle forecasts, social attitudes to travel risk and the maintenance and updating of the national road database.	(€281)	(€309)
Pavement and Materials Research:	407	406
Research is undertaken on the development of procedures for the acquisition of road pavement performance data and on road materials and construction and maintenance methods.	(€517)	(€516)
Technical Services	878	920
The services include: surveys of condition of road pavements, including skid resistance, strength and riding quality; testing soils and road-making materials; technical support in preparing national specifications for road works; road traffic counting and accident recording; preparation of a road signs manual; cost benefit analysis for transport investment.	(€1,115)	(€1,168)
Information and Specialist Advisory Services	347	370
Activities include: maintenance of detailed databases on traffic counts, road accidents, skid resistance of roads, strength and condition of road pavements; provision of library and technical information services.	(€441)	(€470)

Department of Health and Children

The Department of Health was established under the Ministers and Secretaries Act (Amendment), 1946, and comes under the responsibility of the Minister for Health and Children.

The Department's mission is

"in a partnership with the providers of health care, and in co-operation with other government departments, statutory and non-statutory bodies, to protect, promote and restore the health and well-being of people by ensuring that health and personal social services are planned, managed and delivered to achieve measurable health and social gain and provide the optimum return on resources invested".

Its objectives are:

- to support the Minister in the formulation, development and evaluation of health policy and in the discharge of all other Ministerial functions;
- to plan the strategic development of services, through the partnership and consultation with health boards, the voluntary sector, other relevant government departments and other interests;
- to encourage the attainment of the highest standards of effectiveness, efficiency, equity, quality and value for money in the health delivery system.
- to strengthen accountability at all levels of the health service;
- to encourage the continuing development of a customer service ethos in the delivery of health services;
- to optimise staff performance, training and development;
- to represent the Irish interest in EU, WHO and international fora relating to health matters.

A number of bodies and committees of a technical nature come under the responsibility of the Minister. These include the Health Research Board*, the National Drugs Advisory Board, the Postgraduate Medical and Dental Board*, the Food Advisory Committee, the Therapeutics Substances Advisory Committee, the National Cancer Registry Board and the Committee on Dental Care and Fluorides. (Those marked with an asterisk are described separately)

Research and Development

	£'000	
	1999	2000
Health Promotion	202	120
	(€256)	(€152)

The Health Promotion Unit has a dual remit:

- a policy-formulation function within the Department of Health & Children concerned with strategic planning, priority setting, research and evaluation and the development of a multi-sectoral approach to health issues at national and local level.
- an executive function concerned with the development and implementation of national and local health promotion programmes independently or in conjunction with statutory and non-statutory agencies.

	£'000 1999	£'000 2000
In developing policy and in the implementation of programmes, the Unit has built up an effective and important liaison with the health boards and with national and local voluntary agencies.		
The Unit sponsors a Chair in Health Promotion in University College, Galway. The function of this academic Department is to engage in multi-disciplinary research and teaching programmes in health promotion.		

Advisory/Information Services

Advisory and General Support:	3,829 (€4,862)	5,609 (€7,122)
The Department employs consultants to study and advise on various aspects of the health services. The Food Advisory Committee advises on matters relating to the composition, description, manufacture, processing, labelling and advertising of food. The Department participates in the S&T activities of the World Health Organisation and other international organisations.		

Other Science and Technology Activities

National Cancer Registry Board	755 (€959)	800 (€1,016)
The National Cancer Registry Board was established in June 1991, under the Health (Corporate Bodies) Act, 1961. Its functions are inter alia, to research and analyse information relating to the incidence and prevalence of cancer and related tumours in Ireland and to promote and facilitate the use of data collected in approved research projects and in the planning and management of services.		
Irish Medicines Board:	5,148 (€6,537)	4,966 (€6,306)
The Irish Medicines Board is a competent authority for both human and veterinary medicines in Ireland. It administers a service for obtaining, assessing and disseminating information regarding the safety of drugs and medicines. The Board also advises the Minister for Health and Children on matters relating to the safety, quality and efficiency of drugs and medicine, and the conduct of clinical trials.		
It is also involved in regulatory and licensing activities in regard to pharmaceutical products: post-marketing surveillance and monitoring of drugs, inspections of manufacturers' premises and processes, and of wholesalers' premises, stock control systems etc. and the operation of EU Council directives relating to pharmaceuticals and drugs.		
In 1999, the Irish Medicines Board will not be funded directly from the Vote for the Department of Health but from fee income derived from licensing, product authorisations and clinical trials. This is expected to be £5.0m (€6.35m) in 2000.		

Health Research Board

The Health Research Board which comes under the responsibility of the Minister for Health was established on 1 January 1987 under the Health (Corporate Bodies) Act 1961.

Its functions are:

(a) to promote, assist, commission or conduct medical, health and health services research

(b) to promote, assist, commission or conduct such epidemiological research as may appropriately or necessarily be conducted at national level and to assist and support other health agencies with such research

(c) to liase and co-operate with other research bodies in Ireland or elsewhere, in the promotion, commissioning or conduct of relevant research.

The Board consists of 16 members all appointed by the Minister for Health, eight of the appointments being from conjoined nominations by the university medical schools, the Royal College of Surgeons in Ireland and the Royal College of Physicians of Ireland.

Support for the HRB is provided annually by the Department of Health (estimated at £9.5m (€12.2m) in 2000). In addition, some non-voted monies from Irish and U.S. sources, estimated at £1.9m (€2.4m) will be received in 2000.

A total of 50 staff are employed.

Overheads, which comprise 7.3% of the 2000 allocation, are included in the figures.

Research and Development

	£'000	
	1999	2000
Medico-Social Research Surveys:	1,555	2,815
	(€1,974)	(€3,574)
General Research:	3,669	7,321
	(€4,659)	(€9,296)

The Board designs and interprets surveys covering projects on for example, child health and neural tube defects, schizophrenia, drug misuse, alcoholism and evaluation of mental health services.

This programme provides support for research projects through a system of scholarships, grants-in-aid for assistance and expenses, and by way of post-doctoral research fellowships in medicine, dentistry or a related biomedical sciences field, epidemiology and health services research.

The programme also includes co-operative project grants in health services' research, North-South collaborative research project grants, clinical research training fellowships, discipline integration project grants, equipment grants and health services research fellowships.

	£'000 1999	£'000 2000
Research Units:	873 (€1,108)	737 (€936)

The Board will support ten units in 1999 which are researching Hepatitis C, Inflammatory Bowel Disease, Cystic Fibrosis Pulmonary Disease, Eicosanoids in Vascular Disease, Suicide, Gene Therapy for Cancer, Retinopathies Research and Cancer, Early Arthritis, Diabetic Nephropathy, and health status and health gain. It is co-funding a unit in conjunction with the Irish Heart Foundation conducting research into Vascular Disease and Homocysteine Metabolism.

Technical Services

Data Collection and Analysis:	250 (€317)	388 (€493)

The Board continues to operate the National Psychiatric In- Patient Reporting System on an agency basis for the Department of Health. The system covers all psychiatric hospitals and units in the Republic of Ireland. Approximately 28,000 cases are reported each year.

The Board also operates the Roscommon / Westmeath Psychiatric Case Register which is the complement of the Hospital Reporting System in that it provides longitudinal information on the use of all psychiatric services in defined geographical areas. This register reflects rural service provision and an equivalent register operated by the Eastern Health Board in the St. Loman's Hospital catchment area, provides information on service provision in an urban area. The information recorded in the registers is cumulative, longitudinal and person-linked.

In conjunction with the Department of Health the Board maintains an Intellectual Disability Database, and is developing a physical and sensory disability database. The HRB also reports on national drug treatment demand.

Education & Training

	80 (€101)	55 (€70)

University medical and social research undergraduates are employed during their vacations as trainee researchers to give them experience of project duties and research techniques. One year scholarships are awarded to medical students for the purpose of gaining an honours science degree during their medical course.

Postgraduate Medical and Dental Board

The Postgraduate Medical and Dental Board was established in 1980 under the terms of the Medical Practitioners Act, 1978. It replaced the former non-statutory Council for Postgraduate Medical and Dental Education and Training (established in 1973).

The Board has the following functions:

To promote the development of postgraduate medical and dental education and training and to co-ordinate such developments; to advise the Minister for Health, after consultation with other bodies, on all matters, including financial matters, relating to the development and co-ordination of postgraduate medical and dental education and training; to provide career guidance for registered medical practitioners and registered dentists.

The Minister for Health, out of monies provided by the Oireachtas, makes annual grants towards expenses of the Board; the grant for 2000 is estimated at £2.875m (€3.65m).

The staff numbers 3 whole-time and 1 part-time officer are supplemented by 54 part-time professional staff.

Expenditure data includes general overheads of 5% of the figures given.

Education and Training

	£'000 1999	£'000 2000
Grants to Training Bodies:	604 (€767)	822 (€1,044)

Provision and administration of financial assistance to recognised medical and dental professional bodies in their exercise of general control over programmed training for doctors and dentists. The areas grant-aided in 1999 were:

	£	€
General Practice	33,821	42,944
Surgery	193,099	245,185
Higher Medical Training	535,893	680,443
Public Health Medicine	20,509	26,041
Occupational Medicine	51,358	65,211
Other Medicine	10,190	12,939
Paediatrics	13,851	17,587
Obstetrics/gynaecology	26,533	33,690
Radiology	15,332	19,468
Anaesthetics	30,204	38,351
Psychiatry	30,654	38,923
Pathology	18,105	22,989
Dentistry	10,940	13,891

	£'000	
	1999	2000
Co-ordination and Promotion of Postgraduate Education:	986	975
	(€1,252)	(€1,238)
Promotion, co-ordination, facilitation and provision of postgraduate education for doctors and dentists including the training of general practitioners and the organisation of courses in dentistry.		
Establishment of pilot studies on methods of providing such education.	931	1,056
	(€1,182)	(€1,341)
Advice	3	4
	(€3.8)	(€5)
Career guidance activities for the medical and dental professions.		

Department of the Marine and Natural Resources

The Department of the Marine and Natural Resources was established in mid-1997. It brought together all the functions of the former Department of the Marine along with the forestry functions of the former Department of Agriculture and Food and mining and hydrocarbon functions of the former Department of Transport, Energy and Communications.

The Department's key roles and functions are:

- to support and facilitate the availability of efficient and competitive sea transport and port services;
- to maximise the long term contribution of the fisheries sector to the national economy;
- to foster sustainable and environmentally friendly development of the forestry service;
- to promote minerals and hydrocarbons exploration and development for the optimum benefit to the Irish economy, consistent with the highest standards of safety and environmental protection;
- to support the sustainable management and development of the marine coastal zone;
- to promote the sustainable development of marine tourism and leisure;
- to prevent as far as possible, the loss of life at sea by establishing and enforcing high safety standards and providing effective emergency response services;
- to preserve and protect the quality of the marine environment;
- to support and facilitate the development of the marine and natural resources sectors through effective research and technology development.

The Department currently has 251 administrative and 152 professional / technical staff, totalling 403. Of these, about 300 are based in Dublin and the remainder work at a variety of locations throughout the country.

Research and Development

	£'000	
	1999	2000
Forest Research:	436	396
	(€554)	(€503)

The Forest Service is a division of the Department of Marine and Natural Resources. Its objective is to develop and promote the forestry sector in Ireland. In order to achieve these objectives one of its functions is to support research and development activities relevant to forestry development.

Coillte Teoranta and Enterprise Ireland on behalf of the Department undertake forestry research.

Research work undertaken by Coillte Teoranta is production based while that carried out by Enterprise Ireland is product orientated. Enterprise Ireland also receives funding under OPARDF 1994-99 Sub-Programme 2, Measure 3 (Human Resources) to provide for the technology training needs of the Forestry Sector.

	£'000	
	1999	2000

COFORD (Council for Forest Research and Development) was established in 1993 to co-ordinate forest sector research activity. It is funded under the terms of the OPARDF, 1994 - 1999 Sub-Programme 2, Measure 2 (h). 75% of expenditure is re-couped from the EU. Funding of research is mainly by means of grant-aid for project work

COFORD's expenditure is captured in the COFORD return.

Technical Services

Exploration and Mining Division:

118	121
(€150)	(€154)

This involves regulatory and monitoring work for all holders of State facilities under the Minerals Development Acts, 1940 to 1999. At the end of 1999 there were 463 current Prospecting Licences, largely in the central midlands. 27 companies were visited in the field, 169 licence areas were assessed for continuation, and 125 new applications evaluated. Environmental constraints were continuously monitored.

Monitoring and assessment continued on the SMF areas, and also on old mine sites at Avoca, Co. Wicklow and Kingscourt, Co. Cavan, Silvermines Co. Tipperary and Drumgoosat, Co. Monaghan.

It was necessary in 1999 to engage the services of a number of consultants to carry out studies/examinations of various proposals submitted by Exploration and Mining Companies and to monitor development of new mines. In addition, some technical staff attended specialised training courses relating to exploration and mining. In March 1999, officers of the Department attended the Annual Conference of the Prospectors and Developers Association of Canada at Toronto and mounted a marketing/information display stand there. Attendance at this Conference is designed to stimulate investment in mineral exploration and development.

A very successful North Atlantic Minerals Symposium was held in Dublin in 1999. The symposium was arranged to promote and support the minerals industries of Ireland, Newfoundland and Labrador, Canada. Over 200 attended and some 42 talks on all aspects of the minerals industry took place. Field trips to the three underground base metal mines at Navan, Galmoy and Lisheen took place and also to Ireland's gold deposits. There were also trade exhibits and information displays.

Petroleum Affairs Division:

362	1,061
(€460)	(€1,347)

The technical section of this division provides the technical expertise necessary for promotion, monitoring and controlling of petroleum exploration and development activities by private enterprise under licence to the Department, specifically the creation, processing (where necessary), analysis and interpretation of geological, geophysical and engineering data supplied by licensees and the formulation of technical recommendations and advice.

Education and Training

26	11
(€33)	(€14)

The Petroleum Scholarship scheme was funded by certain exploration companies to assist post graduate students undertaking studies leading to advanced degrees relating to the oil and gas exploration industry offshore Ireland. The scheme is administered by the Department.

Marine Institute

The Marine Institute was incorporated under the Marine Institute Act 1991.

Its main functions are:

> 'to undertake, to co-ordinate, to promote and to assist in marine research and development and to provide such services related to marine research and development that in the opinion of the Institute will promote economic development and create employment and protect the marine environment'.

The Marine Institute is also responsible for advising the Minister on policy relating to marine research and to advise the Minister on proposals relating to such research and development requiring funding from the exchequer or from any State owned or controlled organisation.

The Board was appointed in October 1992.

The Institute receives funding in the form of a grant from the Department of the Marine and Natural Resources - £7.895m (€10.025m) in 1999 and £12.299m (€15.617m) in 2000.

Organisational Structure

In order to implement the Government approved marine RTDI strategy, published by the Marine Institute in 1998 **"A Marine Research, Technology, Development and Innovation Strategy for Ireland – A National Team Approach"** (1998) and to facilitate the integration of the Salmon Research Agency, the Marine Institute underwent a major internal reorganisation in 1999. The new structure, established around 5 Divisions, provides an organisational structure appropriate to the delivery of RTDI facilities and services to the marine sector into the New Millennium. A separate Unit, the Irish Maritime Development Office (IMDO), reporting directly to the Chief Executive is to be established in 2000.

In order to provide appropriate marine RTDI facilities and services at a regional and local level, the Institute has up-graded existing laboratories at Abbotstown (Co. Dublin) provided new regional facilities in Galway and is in the process of up-grading facilities at Newport (Co. Mayo).

As a result of this re-organisation , the layout of this report differs from those in previous editions of the Forfás Science Budget.

Marine Science Technology and Innovation Services Division

	£'000	
	1999	2000
	2,583	4,791
	(€3,280)	(€6,083)

The Marine Science Technology and Innovation Division plays a central role in the stimulation and support of research, development, technology and innovation, contributes to national marine S&T policy formulation and maintains an operational capacity in those areas essential to underpinning marine research and resource development.

The Marine STI Division comprises the following sections:

- Marine Food
- Marine Technology
- Water - based Tourism and Leisure

- Communications
- Marine Data Centre
- Research Vessel Operations (RV Celtic Voyager)

Highlights in 1999 included:

- The preparation and publication of "Investment Programme for the Water-based Tourism and Leisure Sector 2000-2006" which was used in successful negotiations on the National Development Plan (2000 – 2006) to secure a specific allocation of £20m (¤25m) for this sector.
- The opening of the Marine Institute Technical Support Base (TSB) in Galway and the establishment of a joint venture company, Marine Technical Development Services Ltd, to provide superintendency and technical support to the Institute's research vessel and engineering services for innovators seeking to develop marine instruments.
- The STI Division has been central to negotiations with the Geological Survey of Ireland and the Department of the Marine & Natural Resources in the planning of a major National Seabed Survey.

	£'000	
	1999	2000

Marine Fisheries Service Division

	2,396	2,417
	(€3,042)	(€3,069)

The Marine Fisheries Services Division (MFSD) provides a wide range of monitoring, assessment and research services on marine fisheries in order to advise on the sustainable exploitation of this multi-million pound resource.

The Division is made up of the following sections :

- Demersal Fisheries
- Pelgic Fisheries
- Inshore Fisheries
- Nephrops Fisheries
- Economic Analysis

The preparation of the annual **"Stock Book"** is a key deliverable of the MSF Division. The Stock Book contains information and analysis relating to the current state of, and management advice for, commercial fish stocks around the Irish coast and is a vital component of Common Fisheries Policy (CFP) negotiations on fish quotas and TACs.

In 1999, work commenced on the preparation of Ireland's case for a review of the **Common Fisheries Policy 2002.** The Review is being undertaken by a team comprising staff of the Marine Institute's Marine Data Centre and MFS Division, BIM and the Department of the Marine and Natural Resources and will produce a computerised Bio-economic database capable of predicting the socio-economic effect of any change in the current regime.

Salmon Management Services Division

	1,826	2,076
	(€2,318)	(€2,636)

The Salmon Management Services Division (SMSD) was formed in September 1999 through the integration of staff from the fish stock assessment and aquaculture sections of the former Fisheries Research Centre. A staff of 20 scientists, technicians and field assistants are currently located in Newport (Co. Mayo), Abbotstown (Co. Dublin) and Galway City.

The new Division has the responsibility to deliver scientific services in relation to salmon, aquaculture, sea trout, eels and some aspects of experimental inshore fisheries. The amalgamation of the specialist skills of those now assigned to SMSD offers a unique opportunity to build a world class expertise in the varied resource areas covered by the Division.

The Salmon Management Services Division is comprised of the following sections:

- Aquaculture
- Wild Salmon Fisheries
- Catchment Management
- Inshore Fisheries

Highlights of 1999 saw the introduction of **Co-ordinated Local Aquaculture Management (CLAMS)** on a pilot basis in Bannow Bay (Wexford), Roaringwater Bay (Cork) and Kilkieran Bay and Killary Harbour (Galway) and the release of over 300,000 tagged salmon smolts into Irish rivers in 1998/99 as part of the **National Microtagging Programme.**

£'000	
1999	2000
1,366	1,686
(€1,734)	(€2,141)

Marine Environment and Fish Health Services

The Marine Environment and Health Services Division (METHS) is responsible for a range of environmental and fish health services required under national and EU regulations. The Division comprises some 25 technical and scientific staff based at the Institute's laboratories in Abbotstown.

The Marine Environment and Fish Health Division is comprised of the following sections:

- Marine Chemistry, which carries out a range of technical monitoring work in the area of the marine environment and marine food products.
- Biotoxin Unit, which manages the national biotoxin monitoring programme, to ensure the safety of shellfish production in species such as mussels, oysters and scallops.
- Fish Health Unit, which provides statutory and diagnostic services in the area of fish disease for the Irish aquaculture industry.

In 1999, the first major marine environmental assessment **"Ireland's Marine and Coastal Areas and Adjacent Seas: - An Environmental Assessment"** was published. This project, jointly funded by the Department of the Marine and Natural Resources and the Department of Environment and Local Government, represents Phase 1 of Ireland's contribution to a **Quality Status Report** (QSR) of the North East Atlantic being prepared under the auspices of the Convention for the Protection of the Marine Environment of the North East Atlantic (OSPAR Convention, 1992).

As part of Phase II of the QSR Process, Irish and UK co-editors completed a joint Irish/UK Report on the waters west of the British Isles (QSR Region III). It is anticipated that the North Atlantic QSR Report will be published in 2000.

	£'000	
	1999	2000
	2,556	4,764
	(€3,245)	(€6,049)

Corporate Services Division

The Corporate Services Division provides a range of services to all Divisions of the organisation to ensure efficient and effective operation during a time of rapid expansion.

The contribution of Corporate Services to the organisation is in five areas:

1. Finance
2. Human Resources
3. Information Technology
4. Administration & Legal Services
5. International Co-operation & Structural Funds

In addition to co-ordinating EU RTDI funding (5th EU Framework Programme, Maritime INTERREG, etc), the international Co-operation section was responsible for the establishment and initiation of a number of co-operative research projects with the US National Oceanic and Atmosphere Administration (NOAA) in pursuit of a Memorandum of Understanding signed between Ireland and the USA in 1995.

The International Co-operation & Structural Funds Section is also responsible for the co-ordination of initiatives supported under the Marine Research Measure of the Operational Programme for Fisheries (1994-1999).

Laboratory Upgrading

In 1999 work was completed on the new Technical Support Base in Galway and work is on-going on the up-grading of the salmon research facilities at the Marine Institute's Newport Base.

Project-based Research

Fifty-four projects in the areas of Fisheries/Aquaculture, Marine Food, Survey and Marine Technology were funded under the Marine Research Measure Programme. The majority of these projects are now successfully complete and the remaining projects will be finished in 2000. The results generated from these projects have added significantly to our understanding of Ireland's marine resource and its sustainable development.

Provision has been made in the 2000 budget to initiate marine RTDI actions to be supported under the Marine RTDI Measure of the Productive Sector Operational Programme (National Development Plan 2000 – 2006).

Bord Iascaigh Mhara (BIM)

[This text has been prepared by Forfás in the absence of information from Bord Iascaigh Mhara]

Bord Iascaigh Mhara (BIM) was established under the Sea Fisheries Act, 1952, and now acts under the aegis of the Minister for the Marine. Its main functions are to promote or engage in any business conducive to the development of the sea fishing industry. Its activities include:

- Market Development: Aims to develop and expand both home and export markets for Irish fish products, provides investment and marketing support services;
- Aquaculture and Planning: Development and expansion of the fish farming sector under the National Aquaculture Grants Scheme; strategic and long term planning and economic/market research on home and export markets for both wild and farmed fish products.
- Fleet Development: Brings all aspects of the fleet together to achieve a single purpose approach to making the fleet profitable. Areas covered include the operation of the Marine Credit Plan, technical services to the fleet and a fishing technology programme to improve the efficiency of the fleet, provide new fishing methodology with the conservation objective.
- Marine Services: Provides a comprehensive manpower development service which incorporates education and training courses for skippers, fishermen, fish farmers and trainee fishermen. The division also develops and expands the national ice supply network.

A total of 120 staff are employed of whom 23 are engaged on S&T activities.

£'000	
1999	2000

Laboratory Services

48	53
(€61)	(€67)

BIM's laboratory activities include both direct seafood analysis as well as the provision of a technical information service. The laboratory services provide microbiological, chemical, nutritional and sensory analysis; hygiene auditing and advisory capabilities; training and BIM development project work. The laboratory plays an integral role in many BIM training courses providing a practical orientation to all aspects of health, hygiene and quality control relevant to the fish processing and farming sectors. In line with the provision of a comprehensive analysis service, a documented quality system is in place and test methodology is continuously being reviewed in line with new research developments.

Fishing Technology Development

609	670
(€773)	(€851)

The objective of this programme is to develop wild fish resources through the evaluation of new fishing methods and equipment, surveys of offshore under exploited fish stocks to ensure an adequate proportion of total allowable catch once quotas are applied. The programme also contains a significant element for the development of non-quota wild shellfish stocks such as crab, shrimp, and scallops which is of critical importance for smaller vessels seeking to diversify from over reliance on heavily exploited fisheries.

In recent years considerable efforts have been made to introduce conservation oriented technology into the fishing industry with some notable successes which will contribute towards long term sustainability of fisheries. The result has been the introduction of square mesh legislation in trawls to considerably reduce juvenile bycatch and V-notch legislation to

	£'000	
	1999	2000

preserve lobster stocks. Such conservation work is still continuing, whilst at the same time development staff are continuously striving to increase the onboard quality handling of fish to maximise value.

Education and Training

1,601	1,761
(€2,033)	(€2,236)

The Board's training programmes are geared to developing practical skills with respect to efficiency, safety, and management functions in order to support the maintenance and expansion of sustainable employment in sea fishing, aquaculture, processing and distribution.

The main objectives of the programme are to: identify and monitor present and future training needs in all sectors of the industry; continue the trend towards provision of training to certificate level of competence; provide the training needed to meet Irish and EU Regulations covering fish handling, hygiene and quality assurance; achieve a Total-Quality attitude throughout the industry; raise safety standards; encourage the adoption of new technologies; provide focused career training for beginners and improvers; provide training to facilitate mobility across industry sectors; provide training for persons, not at present working in the fishing industry, but wishing to engage in sea fisheries and aquaculture; enhance the attractiveness of careers in the sea fisheries industry; generally prepare the work force for increased competition in the Internal Market labour pool; fully access available EU and other trans-national financial support for training programmes.

Central and Regional Fisheries Boards

The Central and Regional Fisheries Boards were established in October 1980 under the Fisheries Act, 1980. The Boards act under the aegis of the Minister for the Marine and Natural Resources.

Their main functions are the protection, conservation, management and development of Ireland's inland fisheries and sea angling resources, and to this end they operate a general policy for the protection and improvement of inland fisheries, the surveying of sea angling resources and the protection of molluscs. Their activities include surveys, development, management, protection and conservation of fisheries; research and experimental work, and management of fish farms and hatcheries.

Seven Regional Fisheries Boards, which were established simultaneously with the Central Fisheries Board, are responsible for fisheries conservation and development in their particular regions.

The Central Fisheries Board is financed by a grant-in-aid under the Fisheries Vote, supplemented in the case of the Regional Boards by fishery rates, licenses, and anglers' registration fees. For 2000 the grant-in-aid to the Boards is £8.95m (€11.37m) for pay, £2.146m (€2.724m) for non pay and a capital allocation of £1.4m (€1.8m). Non-exchequer funding (i.e. current "own resources" of the Central and Regional Fisheries Boards) estimated at £2.2m (€2.79m).

Scientific and Technical Services

	£'000	
	1999	2000
Surveying and Monitoring:	1,420 (€1,803)	1,200 (€1,523)

This activity includes assessing the biological potential of fresh-water lakes and rivers for fishery development; surveys of salt-water areas to locate habitats of popular marine sport fish and surveys of stocks of such fish; evaluating the progress of current development programmes in terms of fish numbers, etc.; checking on conditions of fishing waters, i.e. measuring trophic/nutrient status and pollution hazards which might threaten the Boards' investments in fisheries; water sampling and analysis for pollution control and prosecutions.

Included in the figures for 1999 is £63,000 (€79,993) from the Department of Arts Culture and the Gaeltacht for an investigation of the fish stocks, water quality and weed control on the Royal and Grand Canals and Barrow navigation.

The Board has set up a Survey Unit to survey waters prior to fisheries development plans being drawn up and implemented, under an EU Tourism Operational Programme, from which £73,100 (€92,817) was expended in 1999.

In 1999, an amount of £70,700 (€89,770) was made available to the Board by the Department of Arts Culture and the Gaeltacht (financed through the EU funding) for an investigation into water quality, fish stocks and the status of aquatic weeds in the Shannon/Erne Navigation system.

A project on the rehabilitation of sea trout stocks in the West of Ireland has been approved under an EU Tourism Operational Programme, for which an amount of £134,200 (€170,398) was expended in 1999.

In 1999 The Central Board on behalf of the OPW undertook environmental assessment in relation to Urban Drainage Relief Schemes, the payment for which amounted to £50,000 (€63,487). A similar amount has been allocated for 2000.

Under the Tourism Angling Measure of the EU Tourism Operation Programme, a number of salmonid rivers are being enhanced and rehabilitated and an amount of £71,000 (€90,151) was expended for 1999.

In mid 1999 the Marine Institute funded a one year pilot project for the River Moy based on a Geographical Information System which will assist the Fisheries catchment Management process, £43,500 (€55,234) was expended in 1999 and it is expected that £46,500 (€59,042) will be expended in 2000. A payment costing £550,000 (€698,355) for the construction and development of a coarse fish hatchery and rearing facilities was approved under the Tourism angling Measure of the EU Tourism Operational Programme for which an amount of £297,000 (€377,112) was expended in 1999. The remaining funding of £253,000 (€321,243) will be expended in 2000.

COFORD

COFORD is the National Council for Forest Research and Development. Its activities are funded under the Operational Programme for Agriculture, Rural Development and Forestry, 1994-1999.

COFORD's objectives are:

- to identify research needs and establish priorities in research and development for the forest industry;
- to co-ordinate forest research activities and channel research towards identifiable economic, environmental and social needs;
- to foster specialisation and scientific achievement among research institutes universities and regional technical colleges.

The COFORD Board has 13 members, representative of the industrial (including growers), educational, research and state sectors. The Board has responsibility for setting the research programme, deciding on project approvals and funding levels. COFORD's programme is outlined in the publication "Pathway to Progress".

The executive comprises five full time staff. The COFORD offices are located in the Agriculture Faculty at University College Dublin, Belfield.

COFORD encourages and facilitates participation of Irish forest researchers in the Framework Research and Development Programme of the EU. Irish scientists are involved in nine forestry-related concerted-action and shared-cost projects under the Fifth Framework Programme.

COFORD also fosters linkages and the creation of research networks through its involvement with COST (Cooperation in Science and Technology) programme. The Programme is aimed at the coordination of national research in EU and other European countries. Irish scientists are participating in seven of the eight forestry and forest product COST 'Actions'. Irish representation is further enhanced through membership of the forestry, wood technology and pulp and paper sector groups of the COST Technical Committee on Forests and Forestry. The Director of COFORD currently holds the chairmanship of that technical committee.

COFORD is a member of the European Tropical Forest Research Network (ETFRN). The network promotes exchange of information on research and development in tropical forestry.

International collaboration is further enhanced through membership of the European Forest Institute and IUFRO, the International Union of Forest Research Organisations.

COFORD is a member of the Timber Standards Consultative Committee (TSCC) of the National Standards Authority of Ireland (NSAI). This body has the role of advancing the NSAI on the drafting of Irish, European (CEN) and international (ISO) wood product standards. COFORD is currently finding a project that is examining the impact of new CEN structural timber-grading standards for Irish-grown wood.

	£'000	
	1999	2000

Close liaison with industry is essential in the furtherance of COFORDs' objectives. Such contact is facilitated through membership of the Irish Forestry Industry Chain. The chain brings together the different sectors of the forest industry for which it acts as a unified voice.

Total expenditure allocation by COFORD for 2000 is £1.1m (€1.4m). Funds transferred to Teagasc, Enterprise Ireland, and the Universities to carry out research are accounted for in their respective returns.

Research and Development

Research Support

	915	1,024
	(€1,162)	(€1,300)

Located in UCD the Executive Unit has permanent staff of 5 people and is funded 75% from EU Structural Funds with 25% matching funds from the Department of Agriculture, Food and Forestry.

Research Activities

	135	95
	(€171)	(€121)

The objective of projects supported is to strengthen existing facilities so as to promote research associated with forestry e.g. reproductive material, silviculture and forest management, harvesting and transport and wood processing as well as related socio-economic issues. Funding for projects in HEA colleges and non-commercial state agencies is accounted for in those agencies' programme descriptions.

The Department of Public Enterprise

The Department of Public Enterprise is primarily responsible for the formulation of high-level policy for the transport, energy and communications sectors. One of the major roles of the Department is in exercising its shareholder responsibility for ten commercial State enterprises through effective communication of the State's mandate to each organisation. The Department also has a role in providing the appropriate regulatory framework for the transport, energy and communications sectors and ensuring sufficient resources are provided so that each sector's infrastructure and services are brought to and maintained at an appropriate level.

Science and technology expenditure by the Department of Public Enterprise is incurred by the Geological Survey of Ireland and Met Éireann which are line divisions of the Department. The Department also provides funding through Grant-in-Aid to the Radiological Protection Institute of Ireland. Separate entries in respect of these organisations are contained elsewhere in this report.

During 1997 responsibility for radio and telecommunications technology transferred to the Office of the Director of Telecommunications Regulation while the Exploration & Mining and Petroleum Affairs Divisions were transferred to the Department of the Marine and Natural Resources.

The energy conservation programme formerly administered and managed by the Department is now the responsibility of the Irish Energy Centre.

Geological Survey of Ireland

The Geological Survey of Ireland was established in 1845 and is currently a division of the Department of Public Enterprise.

The GSI is the national geoscience agency. Its role is the provision of information and advice on all aspects of geology, especially as they relate to mineral resources and the environment in Ireland.

This is done by providing basic knowledge of the fundamental geology of the country by field and compilation mapping and the production of maps and reports depicting and describing its geology, geochemistry, geophysics, geotechnical and underground water resources; by offering technical advice to the farming community, prospectors, engineers, industrialists, and the general public; by providing geological advice to Government and local authorities; by assisting Irish geologists and other experts to participate in EU supported programmes.

The GSI has a staff of 74 (including temporary staff) comprising a mix of professional, cartographic, technical and administrative grades.

The GSI is largely financed from allocations made by the Department of Public Enterprise.

The Survey's activities and outputs are organised within five priority programme areas: Bedrock Mapping, Quaternary and Geotechnical, Groundwater, Minerals and Marine Geology.

Technical Services

	£'000 1999	£'000 2000
Bedrock Mapping:	879 (€1,116)	1,054 (€1,338)
This programme is concerned with the completion of national coverage of bedrock geology at 1:100,000 scale by the end of 2001 and of a new national geology map at 1:500,000 in 2001.		
Quaternary - Geotechnical:	794 (€1,008)	679 (€862)
The main work in this Programme is the provision of Quaternary mapping on a county basis for use in Groundwater Protection Reports and Mineral Potential Reports. A national geotechnical database open-file service is also provided.		
Groundwater:	454 (€576)	815 (€1,035)
The main element of this Programme is the provision of Groundwater Protection Assessments to County Councils. The maintenance of national databases on groundwater resources and provision of expert advice on all aspects of groundwater are also key functions.		

	£'000	
	1999	2000
Minerals:	567	679
	(€720)	(€862)
The main activities of this Programme are the provision of Mineral Potential Assessment Reports for Local Authorities and maintenance of a national minerals database and information service.		
Marine Geology:	142	3,871
	(€180)	(€4,915)
This programme has undergone a major expansion from 1999 onwards with the initiation of a major survey of Irish seabed by multi-beam sonar systems over seven years at a total cost of IR£20 million.		

Radiological Protection Institute of Ireland (RPII)

The Radiological Protection Institute of Ireland was established on 1st April 1992 in accordance with the provision of the Radiological Protection Act, 1991. It acts under the aegis of the Minister for Public Enterprise.

Its main functions are: to advise the Government on nuclear energy and associated matters; to regulate the use, transportation and disposal of radioactive materials; to prepare safety codes and regulations for the safe use of ionising radiation; to measure levels of radioactivity in the environment and assess their significance; to provide a dosimetry service and to promote knowledge, proficiency and research in nuclear science and technology.

The RPII is financed by grant-in-aid (£1,704,000 (€2,163,634) in 1999) and income from contracts and charges for services. The Board's earned income in 1999 was £756,000 (€959,922) of which £185,000 (€234,901.5) came from Irish Industry (for export certification services); £185,000 (€234,901.5) from the Personnel Dosimetry Service and £230,000 (€292,040) from contracts, including EU contracts; £90,000 (€114,276) from licence fees and £66,000 (€83,803) from miscellaneous sources.

The total number employed by the Radiological Protection Institute of Ireland is 45 including temporary staff which includes specialists in physics, chemistry, medicine, engineering, health physics, biology and other disciplines.

41 staff are directly involved in science and technology activities.

Expenditure data includes general overheads of 17% of the figures given.

Technical Services

	£'000 1999	£'000 2000
Radiation Protection in Medicine and Industry:	716 (€909)	769 (€976)

The programme monitors the use of ionising radiation in medicine, industry, research and education; undertakes consultancy on design and construction of hospital x-ray units and other facilities involving ionising radiation; inspects dental and veterinary x-ray units; calibrates instruments; enforces safety regulations for all facilities involving ionising radiation. In 1999 there was income of £185,000 (€234,901) from the Personnel Dosimetry Service and £200,000 (€253,948) is expected in 2000.

Monitoring of Environmental Radiation:	524 (€665)	535 (€679)

This programme monitors contamination of the aquatic and terrestrial environment by radioactivity from man-made sources, and related research, and provides an export certification service to Irish industry. The total income from Irish industry was £185,000 (€234,901) in 1999 for export certification services and £160,000 (€203,158) is expected in 2000.

	£'000 1999	£'000 2000
Radon Studies, Radioecology Research and Information Services:	619	661
	(€786)	(€839)

The monitoring of indoor radon levels in homes, schools and workplaces, and research to determine the extent and causation of elevated radon levels in buildings together with research on soil-plant-animal transfer of radiocaesium in upland ecosystems are the main elements of the programme. Information and advice to Government and other agencies on all matters relating to ionising radiation and radiological protection are also provided.

Emergency Planning:	235	240
	(€298)	(€305)

The RPII has a key role to play in the National Emergency Plan for response to any threat of radiation exposure in Ireland as a result of an accidental release of radioactivity into the environment from a nuclear accident abroad. In such circumstances the Institute has responsibility for signalling an alert for the country and for advising initially on any countermeasures which may be necessary. Various elements of the Plan are regularly tested both on a national and international level.

The Institute operates a nation-wide surveillance network, which continuously monitors external radiation. Data from monitoring sites, located mainly at meteorological stations, is relayed to the Institute.

Met Éireann

The Irish Meteorological Service, which adopted the corporate title of Met Éireann in 1996, is a Division of the Department of Public Enterprise and was established in 1936.

The Service is engaged in the following activities:

Collection, analysis and publication of meteorological, geophysical and geochemical data; supply of weather forecasts, statistical information and scientific advice to agricultural, industrial and public utility undertakings, the press, radio and television, maritime interests and members of the public; supply of similar information to Government Departments, Semi-State bodies, and the Defence Forces; provision of meteorological facilities for civil airlines operating to and from airports in Ireland and/or flying over Irish territory, and the supply of advice on meteorological aspects of civil aviation problems generally; development work in fundamental and applied meteorology; co-operation with the meteorological services of other countries and the representation of Ireland at meetings concerned with international co-operation in meteorology.

Met Éireann is funded directly by the Department of Public Enterprise, but a significant portion of the expenditure is recovered by the Department in the form of route charges (£4.6m (€5.8m) in 1999) payable by the airlines for meteorological services to civil aviation, and by means of fees (£1.01m (€1.28m) in 1999) for information and advice supplied to commercial and other interests on a repayment basis.

232 staff are employed in the Service on a full-time basis.

	£'000	
	1999	2000
	8,433	9,564
	(€10,708)	(€12,144)

Scientific and Technical Information

Meteorological information is provided on a routine basis to the media and the general public.

The Premium Rate Weather Service continues to be successful and its scope has been extended to allow for provision of data and/or forecasts via fax. A Premium Rate service dedicated to aviation sector users was introduced in 1998.

More detailed information and special advice is also available directly to agricultural and marine interests, for legal and commercial purposes, to the aviation sector, for off-shore oil exploration and to other specialised interests as required. Much of this information is supplied on a commercial basis.

A warning service is provided for gales and other weather phenomena of a hazardous nature.

The Service also makes available a wide range of climatological and geophysical data in the form of bulletins, brochures and regular publications.

	£'000	
	1999	2000

Research and Development

755	899
(€959)	(€1,141)

Research is carried out in various fields of meteorology and climatology. The primary thrust of the research effort is towards the development of computer models for weather analysis and prediction and participation in an international research collaboration called HIRLAM (**H**igh **R**esolution **L**imited **A**rea **M**odelling), together with Norway, Sweden, Finland, Denmark, Spain, the Netherlands and Iceland. The HIRLAM forecasting model is now in routine use.

In 1997 Met Éireann participated, along with meteorologists from several other countries, in the operational data-gathering phase of FASTEX (**F**ronts and **A**tlantic **S**torm **T**racks **E**xperiment) and is currently involved in the follow-up FASTEX/CSS (**C**loud **S**ystems **S**tudy).

Technical Training

224	378
(€284)	(€480)

Training is provided within the Service in several areas. More specialised training is obtained by sending staff to outside agencies.

International Activities

1,112	1,526
(€1,412)	(€1,938)

Ireland, through Met Éireann, is a member of a number of international organisations which either concern themselves with the co-ordination and standardisation of meteorological activities on a global basis, or comprise co-operative ventures on the part of a number of countries to make available facilities which would be difficult or impossible for an individual country to provide on its own.

These include, inter alia:

WMO: The World Meteorological Organisation is a specialised agency of the United Nations, established in 1950 with its headquarters in Geneva. Through the participation of the national meteorological services of its 185 members, it provides the framework for international co-operation in meteorology and operational hydrology.

EUMETSAT: The European Meteorological Satellite Organisation comprises 17 European States acting in co-operation to provide operational meteorological satellites.

ECMWF: The European Centre for Medium Range Weather Forecasts in Reading, England, is supported by 18 member countries which pool their resources for the production of high-quality computer based forecasts in the range of 2 to 6 days ahead. The Centre's products are available operationally to all the member States.

	£'000	
	1999	2000

Department of Social, Community and Family Affairs

The main functions of the Department are to formulate appropriate social protection policies and to administer and manage the delivery of statutory and non-statutory social, community and family schemes and services.

The mission of the Department is to promote social well-being through income and other supports which enable people to participate in society in a positive way.

Monitoring and Evaluation

1,218	1,273
(€1,547)	(€1,616)

The main objectives are: the systematic review and evaluation of existing social welfare policies, programmes and schemes and the clarification of their objectives, in co-operation with line management; the monitoring of economic and demographic developments and their impact on social welfare; the formulation of new social policy developments and their budgeting; liaison with Government departments and other agencies on social policy matters; development of a statistical base for internal management and for publications.

43 staff are employed on these activities.

Research Funding

Economic and Social Research Institute (ESRI) National Survey

In addition to research projects commissioned by the Department, it has a research programme with the ESRI which relates to the national Living in Ireland (LII) survey. This survey of some 3,000 to 4,000 households is carried out annually by the ESRI as part of a European Panel Survey, undertaken by Eurostat.

Information is collected on the level and composition of household income, the employment and unemployment experience of the households' members and other information which give important insights into the living standards of households.

The aim of the annual survey is to track a large random sample of households through time to examine the nature and causes of changes in income, labour market experience and other aspects of people's lives. The data provide an important resource that has improved significantly the analyses of and public policy debate on poverty, income distribution and the effectiveness of social welfare expenditure.

In specific, the National Anti-Poverty Strategy targets are based on this data source and monitoring of these targets was formally undertaken by the ESRI and published by the Department in 1999 - "Monitoring Poverty Trends".

The data also underpin the ESRI tax-benefit model (SWITCH) which has been developed to model the effects of tax and social welfare changes. This was used, for example, in recent analyses of Budget 2000.

	£'000 1999	£'000 2000
Specific research undertaken by the ESRI for the Department in 1999 included: ► work for the Working Group examining the Treatment of Married, Co-habiting and One-Parent Families under the Tax and Social Welfare Codes in relation to (i) tax/welfare packages and (ii) income equivalence scales; ► study on non-cash benefits, which is expected to be completed in 2000; and ► initial work on the development of SWITCH as a dynamic model.		
Consultancy: The expenditure is in respect of fees and expenses for consultancy assignments and studies. The services for which provision has been made are mainly technical software support and design and development of new computer systems to support the administration of social welfare services.	1,263 (€1,604)	8,248 (€10,473)

Scientific and Technical Services

Anti Poverty Programme: The Combat Poverty Agency Act was enacted in 1986. The Agency's four main functions are policy advice, project support and innovation, research and public education. The Agency's 2000 Exchequer allocation is £2.54m (€3.2m). The Agency undertakes, commissions and publishes research, evaluations policy reports and other information on aspects of poverty. It produces practical resource materials, and supports training and education programmes for the community and voluntary sector as well as providing direct funding through grant schemes. It supports innovative approaches to tackling poverty through resourcing pilot programmes. The Agency is a joint intermediary for the EU Special Support Programme for Peace and Reconciliation along with Area Development Management Ltd.	2,441 (€3,100)	2,585 (€3,282)

Information Services

Library / Publications: Two people are employed in library and publications activities.	73 (€93)	72 (€91)

International Collaboration

The Department is a member of the International Social Security Association, the aims of which are the protection, promotion and development of social security throughout the world.	14 (€18)	15 (€19)

National Economic and Social Council (NESC)

The Council was established by Government in November 1973. Its members, in addition to independents, include representatives from employer and employee unions, agricultural groups and representatives of community and voluntary organisations.

NESC's main task is to provide a forum for discussion of the principles relating to the efficient development of the national economy, the achievement of social justice, and to advise the Government, through the Taoiseach, on their application. Council reports are submitted to the Government, laid before each house of the Oireachtas and published.

It is financed by grant-in-aid from the Department of the Taoiseach and by income from the sale of publications.

NESC employs a total of 7 staff. Consultants are frequently employed to assist in the preparation of specific research reports.

NESC conducts studies on a wide range of relevant topics in the areas of economic and social policy.

£'000	
1999	2000
474	480
(€602)	(€609)

Research

Areas researched include: review of industrial policy; farm incomes; social planning; housing requirements and population change; health and energy policy; economic and social policy assessment; manpower policy. Since the mid-1980s, the Council has published a series of strategy reports which have identified inter-related policy measures which are appropriate to our situation: *A Strategy for Development 1986-1990 (1986); A Strategy for the Nineties: Economic Stability and Structural Change (1990); A Strategy for Competitiveness, Growth and Employment (1993)* and *Strategy into the 21st Century (1996);* and *Programme for Prosperity & Fairness (2000).* These reports provided the framework for negotiation of the national agreements between Government and the Social Partners over the past decade.

In 1999, research projects include: Opportunities, Challenges and Capacities for Choice: Overview Conclusions and Recommendations NESC (No. 104) and also Opportunities Challenges and Capacities for Choice (NESC No. 105).

Income from the sales of NESC publications amounted to £10,000 (€12,697) in 1999 and is expected to be £10,000 (€12,697) in 2000.

Central Bank of Ireland

The Central Bank of Ireland was established under the Central Bank Act, 1942. It replaced the Currency Commission, which functioned as a currency-issuing authority during the period 1927-1942.

The Bank is a member of the European System of Central Banks (ESCB). It participates fully in the policy development and operations of the ESCB which are implemented on a decentralised basis. Monetary policy is determined by the Governing Council of the European Central Bank (ECB). The Governor of the Central Bank of Ireland is one of the 17 members of the Governing Council. The ESCB's statutory objective of maintaining price stability is enshrined in Irish law as the Central Bank's primary objective.

Its other main tasks are to ensure that there is a stable and efficient banking system for taking deposits, extending credit and making payments and to act as advisor, agent and banker to the government. The Central Bank has statutory responsibility for the supervision of most financial institutions in Ireland including banks, building societies, ACC, ICC, TSB and a broad range of non-bank firms, exchanges and collective investment schemes. The Bank's expenses, including those incurred on research activities, are financed from revenue earned from the Bank's operations. No grant-in-aid is received, and the Bank transfers a sizeable amount of surplus income to the exchequer each year.

£'000	
1999	2000
387	481
(€490)	(€611)

Economic Analysis and Research

Work focused on analysis and forecasting of economic conditions, inflation, monetary policy issues, econometric modelling, public finance matters, labour markets and economic statistics. A number of issues pertaining to banking and finance, structural reform and labour markets were also addressed. This work can be considered under a number of broad headings.

Economic Intelligence and Forecasting

Four projections of the economy, covering growth, inflation, unemployment etc, were produced during the year. Together with assessments of the current economic situation, these were published in the Bank's Quarterly Bulletins. Two comprehensive forecasts, based on agreed assumptions, were also produced separately as an input to the ECB's forecasts for the euro area.

Inflation Analysis

Inflation was monitored closely during the year with assessments published in the Quarterly Bulletins. Four separate inflation assessments were also conducted for the ECB, as well as a further number of exercises. The latter was conducted for five sub-aggregates of the Harmonised Index of Consumer Prices, namely Unprocessed Food, Processed Food, Non-Energy Industrial Goods, Energy and Services.

Research work in the inflation area included an appraisal of approaches to analysing inflation, a review of recent forecast performance, development of time-series forecasting

methods and studies of core inflation and traded/non-traded inflation. Work continued in the area of assessing the economy's growth potential and related measures of the output gap, i.e., the gap between potential and actual output in the economy.

Monetary Issues

Work in the monetary policy area centred on the transmission mechanism of monetary policy. Estimates from the Bank's econometric model give a measure of the effects of monetary policy actions. Model simulations suggest that a 1 per cent increase in short-term interest rates gives rise to a fall of ¼ per cent in GNP over two years.

Trends in Irish household and corporate indebtedness were also examined. These confirmed the general impression that indebtedness has increased substantially in recent years, but, to date, it is not particularly high by international standards.

A study was also undertaken on the stability of the demand for money function in Ireland. It did not uncover a stable relationship consistent with economic theory; this is, perhaps, understandable in the light of the volatile environment over the past decade.

An assessment of the evolution of asset prices, housing and commercial property was completed during the year and published in the Autumn Quarterly Bulletin.

Econometric Modelling

All fifteen EU central banks are participating in a project to establish a series of linked macro-economic models under the auspices of the ECB. Development of the Irish model continued during 1999. While the project originated within the context of an ESCB project, the model is tailored towards the Irish economy and is also being used for our own purposes. There are three main uses for the model. Firstly, the model can assist in the assessment of current economic and monetary conditions in the Irish economy. Secondly, it provides a coherent analytical forecasting framework that takes into account the behaviour of economic agents as estimated from historical data. Finally, the model can be used to assess the effects of domestic and ESCB policy actions on the Irish economy. Work on the Irish model during 1999 included estimation, revision and programming of various relationships, examination of the robustness of the model through the analysis of various simulations, preparation of forecasts and policy simulations and discussions with the ECB on the use and effectiveness of the model.

The Irish model is relatively small and aggregated and consists of 75 equations of which 20 are estimated behavioural equations. It contains sufficient detail to estimate the main components of aggregate demand and prices. The rationale for this degree of aggregation reflects both practical and conceptual considerations. The basic time period is quarterly rather than annual as in previous models of the Irish economy. This allows one to better assess the short-term dynamics of the economy. However, as no long historical data on the main economic aggregates are available for Ireland these had to be estimated in the Bank using various indicators to apportion the annual data to quarters. The model is sufficiently small to be easily manageable in the context of forecasting and simulation exercises. A second key feature is the desired economic properties of the model. In line with many other current mainstream macroeconomic models, the Irish model has been specified to ensure that a set of equilibrium relationships hold in the long-run.

The current version of the model takes the traditional backward looking view of expectations but it is planned to extend the model to incorporate a forward- looking approach which is more appropriate.

Public Finance

Fiscal policy is of more significance in the single currency regime, since crowding-out via interest rates is now effectively absent and since monetary policy is no longer available for domestic stabilisation purposes. As part of economic intelligence work during the year, fiscal trends were kept under review. Research work focussed on a number of areas: measurement and assessment of the structural budgetary position, i.e., the budgetary position adjusted for the state of the business cycle, fiscal sustainability regarding the ageing of the population and issues related to the interpretation of the 'close to balance or in surplus' provision of the Stability and Growth Pact.

Labour Markets

An examination of recent labour market trends, along with structural employment, was undertaken during the year. A formal study of the Non-Accelerating Inflation Rate of Unemployment (NAIRU) was also conducted. This concluded that NAIRU has fallen over time, and the current rate of unemployment is now below the NAIRU .

Economic Statistics

Considerable time was devoted to the refinement and adaptation of statistical data pertaining to general economic and public finance areas in order to meet ECB demands. These data are being delivered in efficient electronic form to the ECB. Substantial effort was also devoted to the construction and interpolation of quarterly economic time-series for the Bank's econometric model; until recently, quarterly National Accounts data have not been available for Ireland.

Other Work

The economic and research function also participated in the work of the Economic Policy Committee (EPC) of the European Union. The EPC dealt with a wide range of issues pertaining to the improved functioning of goods, labour and capital markets. It contributed to the formulation of the structural aspects of the Broad Economic Policy Guidelines of the EU and conducted the multilateral reviews of progress with structural reform in all fifteen EU Member States.

Discussions took place with visiting teams from the IMF, OECD and the EU, as well as with a number of credit-rating agencies.

Where appropriate, the results of research projects were reproduced in the Bank's technical paper series. All issues in this series are available in printed form and recent issues can be examined and downloaded from the Bank's website at: http://www.centralbank.ie/research.html.

Papers completed in the Bank were presented at internal workshops where other departments had an opportunity to comment on their findings. Some work was also presented at external workshops and conferences.

Central Statistics Office

The Central Statistics Office is responsible for the collection, processing and dissemination of official statistics to meet the statistical requirements of Government departments, other public bodies, the EU, businesses, universities, research institutes and the general public. The statutory basis for this role is provided by the Statistics Act, 1993 which replaced the Statistics Acts 1926 and 1946 when it came into operation on 1 November 1994. It constituted the Central Statistics Office as a statutory civil service body under the authority of the Taoiseach, established the National Statistics Board on a statutory basis, updated existing statutory provisions for the compilation of official statistics and strengthened the Central Statistics Office's role in co-ordinating the statistics produced by other public bodies.

The CSO's activities are funded by a general vote of the Oireachtas. There are also contributions from the EU for special EU surveys. Net expenditure in 1999 amounted to £17.65m (€22.42m). The 2000 net allocation is £22.51m (€28.58m).

The number of staff provided for in the CSO's 2000 Vote is approximately 565. This figure includes staff temporarily assigned for the Household Budget Survey, which commenced in 1999, and will conclude in June 2000, and the advance staff for the Census of Agriculture to be undertaken in 2000 and the Census of Population which will be undertaken in April 2000.

Programme/Activity Areas

	£'000	
	1999	2000
Industrial and Building Statistics:	2,279 (€2,894)	2,143 (€2,721)

A Census of Industrial Production is undertaken annually. Short-term trends are monitored by sample surveys into industrial production, turnover, employment, earnings and hours worked. Results are published on a monthly and quarterly basis.

A Census of Building and Construction is also undertaken annually together with short-term sample surveys of employment, earnings and hours worked in the building sector. Details of planning permissions granted are also compiled and published quarterly.

Short-term inquiries are conducted into employment and earnings trends in banking, insurance and building societies and in the public sector. The results are published quarterly.

A quarterly CSO inquiry to Quantity Surveyors provides a short-term indicator of output in the non-residential sector.

An inquiry is conducted every four years on labour costs in the industrial, distribution and financial services sectors. The most recent enquiry was carried out in 1997 in respect of 1996.

An annual survey of industrial production at commodity level, using the new harmonised EC PRODCOM nomenclature compatible with that used for foreign trade statistics, was initiated in 1992 in respect of 1991 and has been conducted each year since then.

	£'000	
	1999	2000
	3,128	3,347
	(€3,972)	(€4,250)

Services Statistics:

Indices of both the value and volume of retail sales are compiled and published on a monthly basis for 14 retail business categories and all retail businesses combined.

An up-to-date comprehensive Register of businesses is required under E.U. Regulation 2186/93 and also to meet national statistical needs.

Development work on an integrated business Register has been evolving since 1992. An Annual Register Inquiry addressed to new enterprises and local units was initiated in 1993. A new Register Computer system is being developed. This system will accommodate a Central Business Register capable of meeting user needs. The register provides sampling frames for direct statistical inquiries and provides a framework for grossing sample results. It is envisaged that the Central Business Register will prove a valuable tool in the co-ordination of surveys and the minimisation of response burden on smaller business units.

An annual sample survey was initiated in 1992 for service sectors. This survey covers the Retail and Wholesale Sectors each year with other additional sectors being surveyed on a rotating three-year cycle. The main purpose of the survey is to provide data for the compilation of the National Accounts.

From 1996 onwards (reference year 1995), this survey has been modified to meet the needs of the E.U. Structural Business Statistics Regulation. The main additional requirements of this regulation are an expansion of the annual coverage of services sectors and the use of a harmonised classifications system (NACE Rev 1). In addition, the regulation requires pilot work to develop statistics for services sectors such as education, health and financial services.

Estimated numbers of visits detailing, reason for journey, length of stay and expenditure of visitors to Ireland and Irish visitors abroad are compiled and published quarterly and annually. The estimates are based on two sample surveys of passengers conducted at air and sea ports. International passenger arrivals and departures by air and sea are published monthly.

A monthly National Survey of Accommodation Establishments commenced in 1997, requesting data on accommodation capacity and usage. Details of domestic and outbound travel by Irish residents are requested as part of the Quarterly National Household Survey, which also commenced in 1997. Results from these new surveys are not published.

Reports are compiled and published monthly and annually on the first licensing of motor vehicles. A sample survey of road freight transport activity is on-going and reports are published annually. A survey is carried out into the volume of activity at Irish ports and the results are published.

A quarterly inquiry of industrial and services sectors commenced in 1996 in order to provide short-term economic data for the purposes of compilation of the quarterly national accounts. The quarterly inquiry also satisfies some of the requirements under the pending European Commission Regulation on short-term statistics. The variables collected include - stocks, capital assets, trade creditors/debtors, turnover, persons engaged and wages & salaries.

	£'000	
	1999	2000
Prices, Labour Market and Social Statistics:	5,839	8,074
	(€7,414)	(€10,252)

The Consumer Price Index measures changes in the average level of prices paid by households for consumer goods and services. The index is compiled and published monthly since January 1997.

Output price indices for individual sectors of manufacturing industry and wholesale price indices for building and construction materials, capital goods and petroleum fuels purchased by manufacturing industries are compiled and published monthly.

The new Quarterly National Household Survey was introduced in September 1997, replacing the Labour Force Survey. The new survey will provide estimates of employment and unemployment within three months of the end of each quarter and also incorporates a range of social topics on a modular basis. The 1999 QNHS survey 4th quarter results were published on the 7th March 2000.

An extensive range of monthly and bi-annual statistics is compiled and published in respect of persons on the Live Register.

Vital statistics are compiled and published annually. These include marriage, birth and death data by region; infant mortality rates and natural increases in population. Less detailed statistics are published quarterly.

Agricultural Statistics:	1,736	2,298
	(€2,204)	(€2,918)

Sample surveys of agricultural holdings are conducted annually in June and December from which estimates of the numbers of livestock, agricultural labour input and areas under crops are compiled. Surveys of pig and poultry producers are conducted in June and December.

Special large-scale surveys on the structure of agricultural holdings are undertaken in June every 2 years. Size-of-herd analyses for cattle and pigs are prepared in December every two years. A special survey to determine the wages of permanent agricultural employees is also undertaken every third year (1994,1997 etc.).

In 2000 a complete Census of Agriculture covering land utilisation, livestock numbers, machinery etc. will be undertaken and preparatory work will commence in September 1999.

Estimates of the quantity and value of agricultural outputs, inputs and resultant income arising are prepared and published annually. Monthly data on livestock and milk production are also issued. A large number of commodity supply/utilisation balances are prepared annually.

Agricultural output and input price index numbers together with average absolute price series for the main commodities are published monthly. A land price series is issued quarterly.

Annual releases on fishery and forestry statistics have recently been introduced.

Special publications are occasionally issued e.g. historical agricultural statistics (1847-1996) and a joint analysis of the 1991 Censuses of Agriculture and Population.

	£'000	
	1999	2000
National Accounts:	1,275	1,291
	(€1,619)	(€1,639)

Official estimates are compiled and published annually of Gross National Product (GNP), Gross Domestic Product (GDP) and related aggregates such as national disposable income. These are supplemented by detailed analyses of such items as: the distribution and expenditure of personal income; savings and investment; taxes; and the transactions of the public authorities.

Regional estimates of GDP for the eight Regional Authority areas are published annually. An input-output analysis for 1993 was published in April 1999. The regional and input-output analysis is planned for future years. The regional and input-output analyses, of necessity, relate to earlier years than the primary national accounts results. Work is also under way on the compilation of an annual financial accounts statement.

The time interval between large scale National Household Budget Surveys is being reduced from seven years to five years. The next Survey will be taken in the course of mid-1999 to mid-2000. The survey is conducted over a twelve month period to ensure that expenditures characteristic of different times of the year are captured. Field work for the latest survey took place from May 1994 to June 1995. Results were published in 1997 and provided the basis for updating the weights of the Consumer Price Index.

Balance of Payments:	847	1,243
	(€1,075)	(€1,578)

Quarterly and annual balance of payments estimates are published in the Balance of International Payments Release. The current account tables distinguish credit and debit transactions in merchandise, services, factor incomes and current transfers. The capital and financial account tables show the net balances in respect of capital transfers, transactions in private capital, official capital and credit institutions as well as the changes in external reserves. The net residual or balancing item is also shown.

Trade and Statistical Policy:	498	411
	(€632)	(€522)

Statistics of imports and exports classified by commodity and by country, import and export price (unit value) and volume index numbers and related data are compiled each month and widely disseminated. The statistics are based on data collected by the Revenue Commissioners.

The National Statistics Board has the function of guiding the strategic direction of the CSO, and of establishing priorities in responding to the demand for official statistics.

The Board operates on the basis of 5-year strategic plans. The current plan, "Strategy for Statistics 1998-2002", was published in September 1998.

Progress by the CSO in implementing the Board's strategic plans is published in annual reports. The final progress report on the implementation of the 1998-2002 strategy relates to 1998 and will be published shortly.

	£'000	
	1999	2000
Demographic Statistics:	3,049	4,619
	(€3,871)	(€5,865)

A Census of Population is taken every five years. The results of each census are published on a phased basis as follows:

(1) Preliminary results are made available within a few months of Census Day.

(2) The basic demographic analyses are published 15 months after the census. These include information on age, sex, marital status and family situation. They are made available on a county basis as well as for the state. The corresponding small area population statistics are also made available around this time.

(3) The remaining variables (including analyses by education, branch of industry, occupation, Irish language) are published in the same format as for demographic topics, 24 months after the census.

The most recent census related to 28 April 1996. The census form contained twenty-four questions, all related to individuals. After wide-ranging consultation two new questions were included in the census. These covered full-time and part-time work as well as duration of unemployment. A revised version of the Irish language question was also included. This distinguished frequency of speaking the language as well as ability to speak it.

The staff numbers employed on the census vary considerably according to the stage of processing involved.

Economic and Social Research Institute (ESRI)

The Economic and Social Research Institute (ESRI) was incorporated in 1960 as a company limited by guarantee under the Companies Acts, 1908-1990. The Institute is governed by a Council of 32 members which elects an Executive Committee with delegated powers to manage the Institute. ESRI is an independent, non-profit and non-political organisation.

The essential role of the Institute is to undertake research designed to provide knowledge relevant to solving the major economic and social problems in Ireland. An important secondary function of the Institute is to assist in the development of top quality research workers through its training and education programmes.

The Institute is financed by a general grant-in-aid through the Department of Finance; fees are earned in commissioned research and through sales of publications etc. The grant-in-aid corresponds to approximately 34% of current annual expenditure.

The Institute employs a total research staff of 38, of whom 9 are under short-term contracts. The Institute also employs 29 technical staff in information and technical services and 17 general support staff.

The current activities of the Institute include research in economic forecasting and modelling, economic growth, the international environment, regional issues, the public sector, prices and incomes, demography and labour, social policy, values and attitudes, data and methodology. It also undertakes commissioned studies, surveys and data analysis on behalf of outside organisations and provides training in research for young graduates.

	£'000	
	1999	2000
	3,538	3,776
	(€4,492)	(€4,795)

Research

During 1999, over 103 research projects were completed or in progress in the Institute, the main areas being economic forecasting and modelling, the public sector, the international environment, including perspectives on European development, economics, demography and labour, health, social policy, environmental issues, energy and industrial policy.

Of these, 9 completed projects were commissioned or assisted by the EU, and 28 by other agencies, etc. The resulting publications included 101 in books and journals, and 96 papers. Income from commissioned research amounted to £1,742,220 (€2,212,163) in 1999 and is estimated at £1,861,980 (€2,364,227) for 2000. In addition income from sales of publications, membership fees, etc., amounted to £151,605 (€192,499) in 1999 and is estimated at £125,000 (€158,717) for 2000. Income includes fees earned from research contracts carried out for Government departments amounting to £403,020 (€511,730) in 1999 and £563,430 (€715,409) in 2000.

35 research staff are employed on research activities.

	£'000	
	1999	2000
Information and Technical Services	1,341	1,481
	(€1,703)	(€1,880)

The Survey Unit of the Institute carries out surveys — including fieldwork — and processes data for members of the Institute's staff and for a number of outside bodies. Over twenty major surveys (ranging from 1,000 to 12,000 interviews per survey) are undertaken each year by ESRI's panel of about 250 interviewers as part of the Institute's research programme or are commissioned by outside agencies.

In 1999 ESRI undertook 26 major national surveys including Wave VI of the European Community Household Panel and surveys on Irish business, experience of school leavers, investment in industry, competition, employment, consumer surveys, purchasing power parity, surveys of exporters, construction industry, retail sector, surveys of health issues, incomes, minimum wage and values.

The Institute also conducts the Hospital In-Patient Enquiry Scheme and the Perinatal Recording System on behalf of the Department of Health for which £423,650 (€537,925) was spent in 1999 and an allocation of £550,610 (€699,130) was made in 2000.

In addition to the income from the Department of Health, fees from commissioned surveys/data processing amount to £940,280 (€1,193,909) in 1999, the estimate for 2000 is £983,870 (€1,249,257) of which £80,030 (€101,617) in 1999 and £204,290 (€259,395) in 2000 was on behalf of government departments.

32 whole-time staff are employed in information and technical services including 3 research staff members.

Education and Training	4	30
	(€5)	(€38)

Through its education and training programmes the Institute in 1999 was responsible for the training of 6 postgraduate students and assisted studies of 2 students in the areas of economics and sociology.

Office of Public Works (OPW)

The Office of Public Works provides services to Government Departments and other agencies in the areas of property management, building construction, engineering construction, building maintenance, and conservation and restoration of buildings.

OPW employs specialist staff in all aspects of architecture, engineering, valuation, quantity surveying, and related disciplines. In-house resources are supplemented as required by contracting of services from private sector companies. Over 90% of construction, maintenance, and conservation work is contracted from the private sector.

Total staff employed at the end of 1999 was 1,291. The Office manages expenditure of approximately £472m (€599m) per annum.

In the course of their work OPW's professional staff carry out research and development of new building methodologies (including environmentally friendly techniques), hydraulic and hydrological research and development, and specialist conservation and restoration techniques.

Capital Expenditure On Buildings Connected With Science And Technology

	£'000	
	1999	2000
Department of Agriculture and Food		
Grange EU Vet Agency	150	
	(€190)	
Coosan Veterinary Laboratory	46	
	(€58)	
Enniscorthy District Veterinary Office	3	
	(€4)	
Butter Testing		500
		(€635)
Abbotstown Farm	3	
	(€4)	
Abbotstown Storage	2	
	(€3)	
Tipperary District Veterinary Office	460	1,500
	(€584)	(€1,905)
State Laboratory	265	2,000
	(€336)	(€2,539)
Ordnance Survey Office	152	250
	(€193)	(€317)
Health and Safety Programme	1,041	2,500
	(€1,322)	(€3,174)

Ordnance Survey Ireland

[This text has been prepared by Forfás in the absence of information from Ordnance Survey Ireland]

Ordnance Survey Ireland (OSI) is a Government Office under the ministerial direction of the Minister for Finance. It is headed by a Director who is responsible for the overall management of Ordnance Survey Ireland.

Ordnance Survey Ireland is the national mapping agency. Its primary role is to provide and maintain topographic information for the public and private sectors. OSI is a key player in the rapidly developing geographic information industry and all its products are held as spatial databases which can be integrated with other data sources for administrative, legislative and business purposes. Development at OSI is geared towards the future needs of the information society.

Ordnance Survey Ireland is financed by voted monies from the Oireachtas and by income from the sale of publications, royalty fees and receipts from contract mapping. Ordnance Survey Ireland employs 281 permanent staff, of whom 245 are directly involved in technical mapping activities and 5 in placenames research, with the remainder in administration and support activities.

Actual overhead costs are included under science and technology activities.

	£'000	
	1999	2000
Technical Services	9,895	11,190
	(€12,564)	(€14,208)
Research	130	135
	(€165)	(€171)

Technical Services

The programme includes revision of rural and urban databases, the creation from aerial photography of a new rural large-scale database and a small-scale topographic database. All databases are on-line for instant access to information by customers. Data is provided in both digital and paper form. Currently urban data is updated on an annual cycle. £6,196,000 (€7,867,297) was received for the sale of products in 1999, while the figure for 2000 is expected to be £5,000,000 (€6,348,690).

245 staff are involved in this activity.

Research

Traditionally, research on placenames and archaeology was carried out in OSI, the results of which will be published. However, in February 1999, the staff of the archaeology section transferred to the Department of Arts, Heritage, Gaeltacht and the Islands. Research on placenames continues in OSI.

5 staff are involved in this activity.

The State Laboratory

The State Laboratory is an independent office under the aegis of the Department of Finance. It was established in 1924 following the merger of the Revenue Laboratory and the Chemical Laboratory of the Department of Agriculture and Food.

Its main function is the provision of an analytical and advisory service to Government Departments and offices. The bulk of its work is statutory in nature and the main areas of analytical activity are in the Revenue, Agricultural and Environmental arenas.

Its analytical results and advice are used for the purposes of: litigation and advice; the implementation and formulation of legislation; and assessing the potential requirements for future national and/or EU legislation.

The Laboratory is represented by its staff on National, European (EU) and International committees. It participates at both EU and international levels in the collaborative testing of analytical methods.

The bulk of State Laboratory funding comes directly from the exchequer. A less significant source of income is EU travel refunds.

The State Laboratory employs a total of 74 permanent staff, of whom 63 (including the State Chemist) are directly involved in science and technology activities; the remainder are in administration and support services.

Testing and Analysis

	£'000	
	1999	2000
Agriculture (Inorganic):	384	428
	(€487)	(€543)

Fertilisers are analysed on behalf of the Department of Agriculture and Food to ascertain compliance with both EU and national legislations. Animal feedingstuffs are analysed for minerals, trace elements and heavy metals. [Animal feed accounts for a sizeable proportion of farm expenditure and while the legislation offers protection to the farmer it also prevents the entry of toxic substances into the food chain. This work helps to ensure the high quality and market acceptability of our food.]

Samples are analysed for nutrients, minerals, trace elements, heavy metals, growth promoters, antibiotics, mycotoxins and other naturally occurring toxic substances. Veterinary medicinal products are assayed for compliance with various legislative prescripts.

7 staff will be employed in this activity.

Environment and Special Analytical Services:	628	700
	(€797)	(€889)

The special analytical services section provides a specialised and centralised support service to the rest of the laboratory, in areas such as GC -MS, ICP, AA, XRF, FTIR, specialised non-routine GC- MS, ICP, XRF, specialised non-routine GLC and HPLC.

The environmental area transcends most government departments and samples are analysed, for example, for the Health and Safety Authority, for compliance with; (a) the European Communities (Protection of Workers) (Exposure to Lead) and (b) the Safety Health

	£'000 1999	£'000 2000
and Welfare at Work Act. Samples are analysed for the Department of the Environment and Local Government to check compliance with legislation controlling the levels of lead and benzene in petrol and sulphur in gas oil. This area is also involved with the Department of Agriculture and Food and analyses samples seized in accordance with the Animal Remedies Act. 11 staff are employed in this activity.		
Animal Feedstuffs and Microbiology: Animal feedingstuffs are analysed for nutrients, growth promoters, antibiotics, mycotoxins and other naturally occurring toxic substances. Veterinary medical products are assayed for compliance with various legislative prescripts. Microbiological techniques are employed to assay food and feed for the presence of antibiotics and to detect selected plant diseases. Bacteriological quality of water is determined. 11 staff are employed in this activity.	558 (€708)	622 (€790)
Residues/Contaminants Section: The activities of this section encompass the Department of Agriculture and Food, Local Authorities and State-Sponsored bodies. Samples such as Food, Feed and Environmental samples are analysed for pesticide residues and contaminants. Examples of analysis are Fruits, Vegetables and Milk for Organophosphorus and Organochloride pesticides, water samples for a wide range of pesticide residues, milk and feed samples for Aflatoxins. Frequent requests for "one off" analyses are dealt with such as in animal poisoning cases or where environmental damage is suspected. 6 staff are employed in this activity.	349 (€443)	389 (€494)
Revenue (Alcohol and Oils): The percentage of alcohol in wines and spirits. Techniques employed include distillation SCABA beer analyser and gas chromatography. Excise duties and rebates of duties are laid down in the various Finance Acts. In order to accurately determine the revenue accruing to the State and to prevent the illegal use of rebated products, it is necessary to analyse and characterise hydrocarbon oils. Techniques employed include UV, gas chromatography and HPLC. 6 staff are employed in this activity.	349 (€443)	389 (€494)
Customs/CAP: The Common Customs Tariff (CCT) determines the duty payable on imported goods and chemical analysis enables the Revenue Commissioners to classify goods for this purpose. Samples are diverse in nature ranging from pure chemical to plastics to processed products like food. The analyst relies heavily on instrumental techniques such as chromatography and spectroscopy. Samples are also analysed in accordance with the prescripts of the Common Agricultural Policy of the EU. 11 staff are employed in this activity.	594 (€754)	662 (€841)

	£'000	
	1999	2000
Toxicology:	558	622
	(€709)	(€841)
Analysis is carried out on post mortem biological tissues and fluids of human origin in order to ascertain the cause of sudden or unexplained deaths. Biological tissues of veterinary origins are assayed for a variety of reasons. The analyses in question are normally present at residue levels and confirmation techniques add to the analysis time. In November 1990, the Laboratory agreed to participate in a programme to detect the use of beta agonist in the beef industry. This has increased the volume of work in the toxicology area considerably.		
10 staff are employed in this area.		
Quality Control and Accreditation:		
	70	77
	(€89)	(€98)
In recognition of the importance of ensuring a high standard of quality control throughout the Laboratory, and of ensuring that the Laboratory is accredited by the Irish Laboratory Accreditation Board, a Senior Chemist has been appointed to oversee these activities throughout the Laboratory.		
One person is employed in this area.		

Reports Published by Forfás 2000 - 2001

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Forfás Annual Report 1999	July 2000
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The 4th Framework Programme in Ireland	April 2001
Commercialisation of Publicly Funded Research *Irish Council for Science, Technology & Innovation (ICSTI)*	April 2001
The Third Report of the Expert Group on Future Skills Needs Responding to Ireland's growing skill needs	July 2001
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